Vol. 1072 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

November 11, 1986

U.S.
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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

November 11, 1986 Volume 1072 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
if paid before Nov. 1, 1986	930.00
if paid on or after Nov. 1, 1986	1015.00
International fees	
Basic fee (first 30 pages):	
if paid before Nov. 1, 1986	375.00
if paid on or after Nov. 1, 1986	430.00
Basic Supplemental fee (for each page over 30):	
if paid before Nov. 1, 1986	7.00
if paid on or after Nov. 1, 1986	8.00
Designation fee for the first 10 national or regional offices:	
if paid before Nov. 1, 1986	90.00
if paid on or after Nov. 1, 1986	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Nov. 8, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,413,357 through 4,414,690
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge

are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 24, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,345,386	06/220,919	8/24/82
4,345,394	06/275,353	8/24/82
4,345,403	06/232,876	8/24/82
4,345,441	06/222,668	8/24/82
4,345,519	06/239,041	8/24/82
4,345,520	06/229,649	8/24/82
4,345,535	06/216,376	8/24/82
4,345,548	06/222,578	8/24/82
4,345,575	06/265,669	8/24/82
4,345,595	06/248,566	8/24/82
4,345,596	06/333,704	8/24/82
4,345,616	06/234,828	8/24/82
4,345,618	06/223,902	8/24/82
4,345,692	06/233,884	8/24/82
4,345,703	06/234,773	8/24/82
4,345,710	06/245,941	8/24/82
4,345,745	06/292,407	8/24/82
4,345,750	06/230,525	8/24/82
4,345,761	06/280,239	8/24/82
4,345,766	06/261,539	8/24/82
4,345,770	06/253,389	8/24/82
4,345,772	06/273,892	8/24/82
4,345,788	06/217,748	8/24/82
4,345,909	06/261,994	8/24/82
4,345,913	06/225,134	8/24/82
4,345,917	06/276,244	8/24/82
4,345,933	06/247,471	8/24/82
4,345,960	06/268,197	8/24/82
4,345,966	06/240,092	8/24/82
4,345,982	06/237,905	8/24/82
4,345,988	06/225,012	8/24/82
4,345,995	06/236,588	8/24/82
4,346,002	06/251,023	8/24/82
4,346,039	06/245,382	8/24/82
4,346,048	06/258,642	8/24/82
4,346,057	06/275,862	8/24/82
4,346,062	06/234,128	8/24/82
4,346,112	06/278,687	8/24/82
4,346,124	06/259,854	8/24/82
4,346,132	06/254,070	8/24/82
4,346,180	06/329,405	8/24/82
4,346,191	06/240,001	8/24/82
4,346,192	06/328,198	8/24/82
4,346,221	06/239,566	8/24/82
4,346,286	06/236,457	8/24/82
4,346,289	06/270,630	8/24/82
4,346,419	06/258,062	8/24/82
4,346,422	06/237,673	8/24/82
4,346,426	06/223,142	8/24/82
4,346,468	06/284,784	8/24/82
4,346,469	06/284,785	8/24/82

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
Re. 31,968	06/620,637	8/13/85	6/14/84	10/8/86
(4,335,266)	(06/221,761)	(6/15/82)	(12/31/80)	
4,334,018	06/216,696	6/8/82	12/15/80	10/8/86

Recission of Notice of Patent Expiration

The Notice of Expiration due to failure to pay maintenance fees for the following patent was published in error and is hereby rescinded:

Patent Number	Serial Number	Issue Date
4,339,327	06/256,898	7/13/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,430,583, Re. S.N. 827,270, Filed Feb. 6, 1986, Cl. 307/448, APPARATUS FOR INCREASING THE SPEED OF A CIRCUIT HAVING A STRING OF IGFETS, Masakazu Shoji, Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 254

4,479,409, Re. S.N. 901,437, Filed Aug. 28, 1986, Cl. 81/58.3, OPEN-END RATCHET WRENCH, John I. Antonius, Owner of Record: *Inventor,* Attorney or Agent: M. H. Hartwell, et al., Ex. Gp.: 323

4,480,690, Re. S.N. 845,229, Filed Mar. 28, 1986, Cl. 166/250, ACCELERATED DOWNHOLE PRESSURE TESTING, Roy R. Vann, Owner of Record: *Geo Vann, Inc., Houston, Tex.,* Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 354

4,594,663, Re. S.N. 906,848, Filed Sept. 15, 1986, Cl. 364/401, CREDIT TRANSACTION PROCESSING SYSTEM, Masanori Nagata, et al., Owner of Record: *Omron Tateisi Electronics Co., Kyoto, Japan,* Attorney or Agent: Arthur Schwartz, et al., Ex. Gp.: 236

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Errata

In the "Supplemental Register" section of the Trademark Official Gazette of Sept. 23, 1986, the mark in Registration No. 1,410,977 was misidentified as THE PAPER OUTLET WE REALLY APPRECIATE YOUR BUSINESS.

1,410,977	TM 152	Sept. 23, 1986

The mark is THE PAPER OUTLET.

Oct. 15, 1986. PATRICIA M. DAVIS,
Administrator for
Trademark Operations.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to: General Electric Co., Motor Business Group, 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind. 46801–2204; Attention: Patent Counsel

4,189,518. CURED POLYMERIC COATING MATERIAL, COATED SUBSTRATE, AND PROCESS OF FORMING.

4,546,658. PIEZOELECTRIC FORCE/PRESSURE SENSOR.

4,547,826. GENERALIZED REAL-TIME THERMAL MODEL.

4,578,610. SYNCHRONOUS DISK MOTOR WITH AMORPHOUS METAL STATOR AND PERMANENT MAGNET ROTOR AND FLY WHEEL.

4,231,061. INSTANT COLOR SLIDE RECORDER OF CRT IMAGE. *Sammuel Freeman,* 13 Birchwood Ct., East Syosset, N.Y. 11791

PATENT NOTICES

Certificates of Correction for the Week of Nov. 11, 1986

PP. 5,767	4,566,456	4,589,964	4,604,572
Re. 32,221	4,567,104	4,590,352	4,604,892
4,392,159	4,568,468	4,590,907	4,605,006
4,434,496	4,568,497	4,592,777	4,605,099
4,477,073	4,568,574	4,593,131	4,605,409
4,488,237	4,568,925	4,593,595	4,605,412
4,490,035	4,569,065	4,593,779	4,605,421
4,493,034	4,569,790	4,594,100	4,605,495
4,494,849	4,570,211	4,594,362	4,605,539
4,505,580	4,571,647	4,594,966	4,605,626
4,513,395	4,572,574	4,595,430	4,605,797
4,518,227	4,572,643	4,595,431	4,605,823
4,521,411	4,573,283	4,595,768	4,606,137
4,530,831	4,573,587	4,595,819	4,606,153
4,532,536	4,573,947	4,596,274	4,606,377
4,535,789	4,574,856	4,597,648	4,606,432
4,536,302	4,576,152	4,597,798	4,606,519
4,536,514	4,576,646	4,597,831	4,606,587
4,536,825	4,576,855	4,598,240	4,606,921
4,537,904	4,578,139	4,598,312	4,607,044
4,538,553	4,578,485	4,598,402	4,607,129
4,539,109	4,578,937	4,599,583	4,607,523
4,539,579	4,579,361	4,599,883	4,607,845
4,542,157	4,579,552	4,600,442	4,608,094
4,544,005	4,579,713	4,600,484	4,608,111
4,545,940	4,581,095	4,600,585	4,608,118
4,547,663	4,581,652	4,600,673	4,608,515
4,549,347	4,582,542	4,600,756	4,608,929
4,550,276	4,582,837	4,600,994	4,608,995
4,551,721	4,583,804	4,601,374	4,609,134
4,552,308	4,584,170	4,601,561	4,609,340
4,554,180	4,584,610	4,602,090	4,609,578
4,555,472	4,584,798	4,602,148	4,609,665
4,555,839	4,585,471	4,602,356	4,609,827
4,557,061	4,585,574	4,602,472	4,610,070
4,557,307	4,585,711	4,603,100	4,610,252
4,557,915	4,587,842	4,603,223	4,610,434
4,559,086	4,588,416	4,603,292	4,610,743
4,559,133	4,588,423	4,603,371	4,610,993
4,560,256	4,588,592	4,603,512	4,611,083
4,563,079	4,588,819	4,603,739	4,612,609
4,563,346	4,588,925	4,604,248	
4,563,927	4,589,279	4,604,468	

Disclaimer

4,238,461.—*Egbert Devries,* Kettering, Ohio. REMOVAL OF ODORS FROM GAS STREAMS. Patent dated Dec. 9, 1980. Disclaimer filed Aug. 27, 1986, by the assignee, *Quad Environmental Technologies Corp.*

The term of this patent subsequent to Nov. 14, 1995, has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 30, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-07-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	10-09-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	6-01-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-12-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-21-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-25-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-04-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-03-86

Expiration of patents: The patents within the range of numbers indicated below expire during September 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,464,063 to 3,470,563, inclusive

Plant Patents ..... Numbers 2,918 to 2,926 inclusive

REISSUES

NOVEMBER 11, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

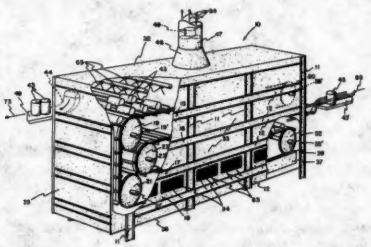
Re. 32,280
SPIN COOLER

Donald L. Butler, 1300-H Steinbeck Dr., Raleigh, N.C. 27609, and Thomas E. Martin, 1011 Manchester Dr., Cary, N.C. 27511

Original No. 4,531,382, dated Jul. 30, 1985, Ser. No. 524,448, Aug. 18, 1983. Application for reissue Sep. 16, 1985, Ser. No. 776,622

Int. Cl.[4] F25D *17/02*

U.S. Cl. 62—375 **8 Claims**



1. An improved cooling system for product containers comprising: a plurality of track rail means so arranged to form a plurality of laterally adjacent product container travel lanes each containing a plurality of tiers; entry and exit means to and from said travel lanes for product containers; a plurality of crossovers for interconnecting each said product container travel lane with at least one adjacent lane such that product containers move from one lane to an adjacent lane at said crossovers; a plurality of pusher bar means extending across said lanes for rollingly moving said containers therealong; means for interconnectingly driving said pusher bar means such that said containers travel substantially the entire length of every lane in every tier prior to exiting said cooling system [so as to properly cool the product therein while said system requires only a relatively small amount of floor space; and means for forming an active cooling system for cooling product containers so they move along said lanes]; *a plurality of nozzles disposed above selected lanes of said tiers for spraying cooling water over the product containers as the same move through said cooling system; and at least two laterally adjacent sump means disposed below said tiers for recirculating water sprayed from said nozzles, each said sump being operatively connected to selected nozzles disposed above selected lanes of said tiers, whereby more efficient cooling of product containers can be accomplished while said cooling system requires only a relatively small amount of floor space.*

Re. 32,281
COPY SHEET-FEEDING APPARATUS

Shuzo Tsubo, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Original No. 4,332,375, dated Jun. 1, 1982, Ser. No. 145,878, May 1, 1980. Application for reissue May 8, 1984, Ser. No. 608,277

Claims priority, application Japan, May 10, 1979, 54-57406; May 10, 1979, 54-57407; May 10, 1979, 54-57408; May 10, 1979, 54-57411; May 10, 1979, 54-57412; May 10, 1979, 54-57416

Int. Cl.[4] B65H *1/04, 1/12*

U.S. Cl. 271—9 **6 Claims**

1. A sheet feeding apparatus comprising:

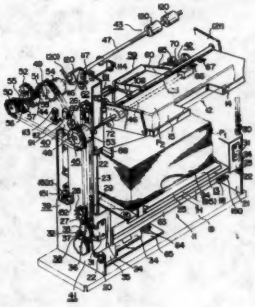
first sheet-holding means having a sheet rest for supporting a stack of sheets which sheet rest is movable up and down between a sheet replenishing position and a sheet supply position;

second sheet-holding means having a cassette for supporting a stack of sheets and which is movable between a sheet replenishing position and a sheet supply position;

a sheet cover movable between a closed position at which it covers [both] the first [and second] sheet-holding means and an open position at which [both of] said first [and second] sheet-holding means [are] *is* exposed;

a first drive mechanism for driving the first sheet-holding means between the sheet replenishing position and the sheet supply position;

a detection mechanism for detecting the open position and the closed position of the cover and for supplying to the



first drive mechanism an open signal when the cover is open and a closed signal when the cover is closed, the first drive mechanism causing the sheet rest to (a) move from the sheet supply position to the sheet replenishing position in response to the open signal and (b) move from the sheet-replenishing position to the sheet supply position in response to the closed signal; and

a second drive mechanism for causing the cassette to (a) move from the sheet supply position to the sheet replenishing position in response to the movement of the sheet rest from its sheet supply position to its sheet replenishing position and (b) move from the sheet replenishing position to the sheet supply position in response to the movement of the sheet rest from its sheet replenishing position to its supply position.

Re. 32,282
TELEVISION GAMING APPARATUS

Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Original No. 3,728,480, dated Apr. 17, 1973, Ser. No. 126,966, Mar. 22, 1971. Continuation of Ser. No. 697,798, Jan. 15, 1968, abandoned. Application for reissue Jun. 27, 1977, Ser. No. 810,538

Int. Cl.[4] A63F *9/22*

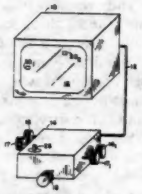
U.S. Cl. 273—85 G **18 Claims**

27. [The] *In* combination [of claim 1, further including] *with a raster scan home television receiver, apparatus for permitting the playing of amusement games on the screen of the television receiver by generating "dots" upon the screen of the receiver to be manipulated by a participant, comprising:*

a control unit for generating signals representing the "dots" to be displayed, said control unit further including means for generating synchronizing signals to synchronize the television

raster scan of said receiver and means for manipulating the position of the "dots" on the screen of said receiver;

means for directly coupling the generated signals only to said television receiver wherein the receiver is also adapted to receive broadcast television signals, whereby said "dots" are displayed only upon the screen of said receiver being viewed by the participant; and and



means for "shooting" at said "dots," said "shooting" means including light responsive means responsive *only* to a displayed "dot" when aligned therewith *and disposed a substantial distance from the television screen when playing a shooting game thereby simulating actual target shooting, said light responsive means not being responsive to the television raster scan of said receiver except where the raster is modulated to display a dot.*

Re. 32,283

VACCINES

Peter Apontoweil, Leersum, and Manfred M. Krasselt, De Bilt, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Original No. 4,481,188, dated Nov. 6, 1984, Ser. No. 409,996, Aug. 20, 1982. Application for reissue Dec. 18, 1984, Ser. No. 682,859

Claims priority, application Netherlands, Aug. 28, 1981, 81-200960.3

Int. Cl.[4] A61K *39/215, 39/12*

U.S. Cl. 424—89 **5 Claims**

1. A combined infectious bronchitis water-in-oil emulsion oil-adjuvant vaccine having a volume ratio between the aqueous phase and the oily phase from 3:7 to 1:1 of at least 104.0EID.50 per dose of each of the virus components of inactivated vaccine derived from at least one virus strain selected from the group consisting of *a serotype of* infectious bronchitis virus strain identified by the internal notation Gelderland. 901 deposited at the Czechoslovak National Collection of Type Cultures of the Institute of Hygiene and Epideminology in Prague under No. CNCTC AO 17/81 and deposited at the Collection Nationale de Cultures de Micro organismes d'Institute Pasteur, Paris, under No. I-168 and *a serotype of* infectious bronchitis virus strain by the internal notation Brabant. 802, deposited at the Czechoslovak National Collection of Type Cultures of the Institute of Hygiene and Epidemiology in Prague under No. CNCTC 18/82 and deposited at the Collection Nationale d'Institute Pasteur, Paris, under No. I-202 combined with a second vaccine derived from the IBV H120 or the IBV H52 of the Massachusetts type.

Re. 32,284

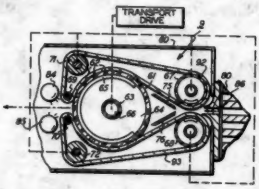
DOCUMENT STORAGE AND TRANSPORT APPARATUS

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original No. 4,089,515, dated May 16, 1978, Ser. No. 794,483, May 6, 1977. Continuation of Ser. No. 649,388, Jan. 15, 1976, abandoned. Application for reissue Jul. 2, 1979, Ser. No. 53,865

Int. Cl.[4] B65H *5/22;* **G03G** *21/00*

U.S. Cl. 355—3 SH **30 Claims**



2. Recirculating feeder apparatus for use with a copier to produce multiple copies of an original, the original including sheets of support material having first and second faces, said apparatus comprising:

(a) an exposure position;

(b) a storage facility for holding the original sheets; and

(c) means for circulating said original sheets successively a plurality of times from said storage facility to said exposure position and back to said storage facility for presenting the first and second faces of the original sheets to said exposure position, said circulating means inverting each individual sheet an odd number of times between each of its presentations.

Re. 32,285

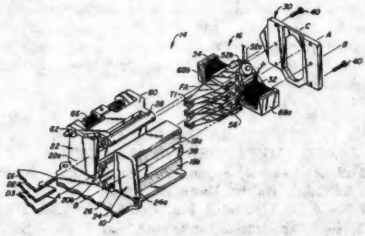
LINEAR ACTUATOR FOR A MEMORY STORAGE APPARATUS

Paul L. Farmer, San Martin; Frank C. Gibeau, Los Altos; Stanley F. Brown, Cupertino, and Garold W. Plonczak, Santa Clara, all of Calif., assignors to Atasi Corporation, San Jose, Calif.

Original No. 4,414,594, dated Nov. 8, 1983, Ser. No. 352,943, Feb. 26, 1982. Application for reissue Jun. 13, 1984, Ser. No. 619,973

Int. Cl. G11B *5/55;* **H02K** *41/02*

U.S. Cl. 360—106 **9 Claims**



2. [The actuator assembly according to claim 1] *A transducer actuator assembly for a rotating disc memory apparatus comprising: a carriage; means for mounting at least one transducer at one end of the carriage; means adjacent the periphery of the rotating disc of the memory apparatus for guiding the carriage for movement along a desired linear path and stroke of travel relative to the disc; a pair of symmetrically disposed electromagnetic motors, each including a central pole, for reciprocating the*

carriage to transfer the transducer to a desired track location on the rotating disc including drive coil means mounted to and extended laterally from the sides of the carriage at a location between the inner and outer ends of the carriage for forming at least two identical effective coil sections that are respectively symmetrically arranged about a plane that extends through the center of the carriage and that is parallel to its linear direction of travel, and at least two identical pairs of permanent magnets stationarily mounted to the memory apparatus near the periphery of the disc at the opposite sides of the carriage and spaced opposite the inner end of the carriage for forming two air gaps that respectively register with said two coil sections, said coil sections surrounding and forming air gaps with said central poles, whereby when said coil means is energized motive forces are applied generally along two transversely spaced lines that are symmetrical about said center plane of the carriage, wherein said drive coil means comprises a pair of separate identical coils, each coil including a winding section that registers with the air gap of one of said pairs of permanent magnets.

Re. 32,286

APPARATUS FOR ELECTRONICALLY CONTROLLING INTERNAL COMBUSTION ENGINE

Masumi Imai; Masao Takato, both of Hitachi, and Hiroastu Tokuda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,310,889, dated Jan. 12, 1982, Ser. No. 952,326, Oct. 18, 1978. Application for reissue Jan. 5, 1984, Ser. No. 568,426

Claims priority, application Japan, Oct. 19, 1977, 52-125968

Int. Cl. F02P *5/08, 11/06*

U.S. Cl. 364—431.04 **38 Claims**

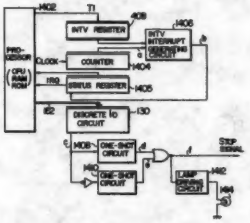
1. An electronic control apparatus for an internal combustion engine comprising

a processor having a central processing unit, a random access memory and a read-only memory *utilized for controlling operational conditions of said engine;*

means for generating an interrupt signal *pulse train* having a predetermined period for causing an interrupt request signal to be applied to said processor; and

means for detecting said processor to be in a state of its normal operation and generating an output signal in response to said processor generating a signal equivalent to a pulse train having a pulse duration substantially equal to said predetermined period.

38. An electronic control apparatus for an internal combustion engine comprising:



a processor having a central processing unit, a random access memory and a read-only memory utilized for controlling operational conditions of said engine;

means for generating an interrupt signal pulse train having a predetermined period for causing an interrupt request signal to be applied to said processor; and

means for detecting said processor to be in a state of its normal operation and for producing an indication when said processor is not generating a signal equivalent to a pulse train having a pulse duration controlled in accordance with said interrupt request signal.

PLANT PATENTS

GRANTED NOVEMBER 11, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,799

LOTUS PLANT CV ANGEL WINGS

Perry D. Slocum, 191 Leatherman Gap Rd., Franklin, N.C. 28734

Filed Oct. 18, 1985, Ser. No. 789,311

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of lotus plant substantially as herein shown and described.

PATENTS

GRANTED NOV. 11, 1986

ERRATA

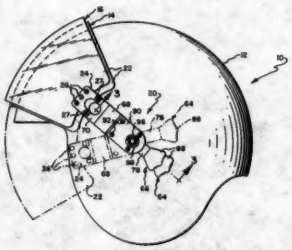
For CLASS	See PATENT NO.
354-074	4,621,786
420-061	4,622,067
420-111	4,622,081
540-348	4,622,177
540-358	4,622,178
540-139	4,622,179
379-063	4,622,438
379-252	4,622,439
381-068	4,622,440
379-345	4,622,441
379-402	4,622,442
361-433	4,622,611
361-433	4,622,612

PATENTS

GRANTED NOVEMBER 11, 1986

GENERAL AND MECHANICAL

4,621,377
HELMET ASSEMBLY
David N. Pennell, Covina, Calif., assignor to Figgie International Inc., Willoughby, Ohio
Filed Mar. 12, 1985, Ser. No. 710,995
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—6 **11 Claims**



1. A low profile mechanism for the retention and actuation of a visor on an aircraft flight helmet assembly of the type having a helmet, a first visor, and right and left side pivot means which mount the visor on the helmet for movement between fully raised and completely down positions, said mechanism for the retention and actuation of the visor being incorporated in the left side pivot means which comprises:

a pivot shaft fixed to the left side of said helmet and extending outwardly therefrom; and

first visor actuating arm assembly means journalled on said pivot shaft and capable of causing the first visor to be moved between its raised and lowered positions, said first visor actuating arm assembly means including

a visor mounting arm having a forward portion secured to the first visor, and an intermediate opening which receives the pivot shaft,

a manually operable slide means slidably supported by said visor mounting arm for sliding movement between locking and unlocking positions, said slide means being provided with an oblong opening between its ends which receives said pivot shaft, said slide means, when in the unlocking position capable of being rotated about said pivot shaft to cause corresponding movement of the associated visor mounting arm and visor to thereby move said visor between raised and lowered positions, and said slide means, when in the locking position, capable of locking the associated visor mounting arm and visor from rotational movement about said pivot shaft, and

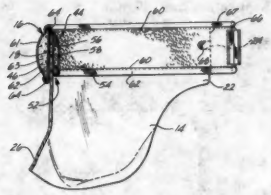
biasing means supported by said visor mounting arm and engageable with said slide means and operable to normally bias the slide means to its locking position.

4,621,378
EYESHIELD
Robert A. Hatchman, 1410 S. 8th St., Arcadia, Calif. 91006
Filed May 23, 1984, Ser. No. 613,301
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—9 **13 Claims**

1. An eyeshield comprising:

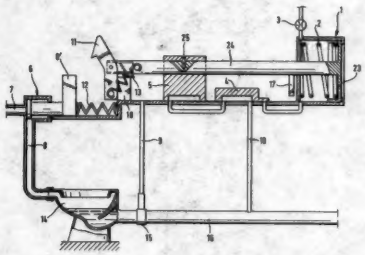
a transparent lens adapted to cover and protect the eyes, the lens having an uppermost margin to extend about the frontal portion of the head to terminate at opposite ends, at least one of such ends including a slot; and

a headband at least a portion of which includes semi-elastic inner and outer panels connected to define a pocket adapted to expand lengthwise and removably receive the margin for interconnection of the headband and lens, a tack provided between the panels through the pocket and



disposed to be located proximate the slot when the pocket is expanded, release of the pocket causing said pocket to elastically contract to position said tack in the slot to secure the lens in the pocket.

4,621,379
FLUSHING OPERATING MEANS FOR VACUUM TOILET
Vaino Kilpi, Espoo, Finland, assignor to Oy Wartsila Ab, Helsinki, Finland
Filed Jan. 7, 1985, Ser. No. 689,397
Claims priority, application Finland, Jan. 11, 1984, 840086
Int. Cl.[4] E03D *3/10*
U.S. Cl. 4—431 **26 Claims**



1. A valve control mechanism for a flushable sewage producing unit, such as a toilet, having a flushing water inlet and also having a sewage output for connection to a vacuum sewer, comprising

a normally-closed water valve having an inlet for connection to a source of water under pressure and an outlet for connection to the flushing water inlet of a sewage producing unit,

a normally-closed sewer valve that can be interposed between the sewage outlet of the sewage producing unit and a vacuum sewer,

a motor that is operable by vacuum and has an output member that is movable from an initial position, in which both the water valve and the sewer valve are closed, through a range of positions in which the output member opens and closes the water valve and the sewer valve, and back to the initial position,

an operating valve having an inlet for connection to the vacuum sewer and having a condition in which its inlet is connected to the motor to initiate operation of the motor by communicating vacuum to the motor, and

means for accumulating sufficient potential energy when vacuum has been communicated to the motor, and before the water valve and the sewer valve are opened, to cause

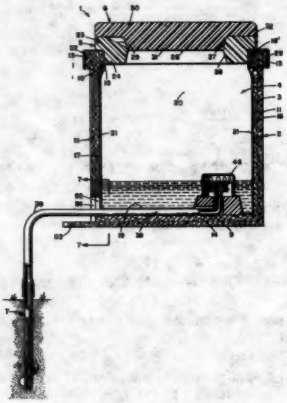
the output member to move through its range of positions and back to the initial position.

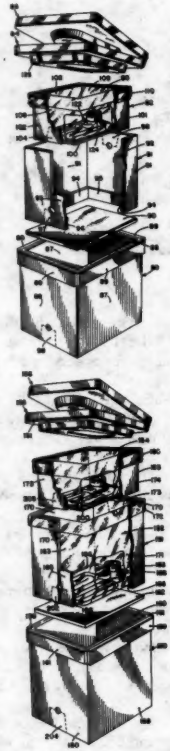
4,621,380

TOILET ASSEMBLIES

Leland S. McGill, Portage, Ind., assignor to Richard G. Kinney, Merrillville, Ind.

Division of Ser. No. 423,642, Sep. 27, 1982, Pat. No. 4,536,902.
This application Jun. 27, 1985, Ser. No. 737,621
Int. Cl.[4] A47K *3/022*
U.S. Cl. 4—476 **11 Claims**





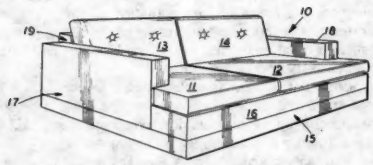
1. A toilet system comprising an outer housing, a supporting enclosure arranged in said housing, a large receptacle disposed in said enclosure, a container mounted on said enclosure, a smaller receptacle disposed in said container, a seat detachably mounted on said container and provided with an opening through which human body waste may be discharged into said smaller receptacle, said seat when detached allowing removal of said container and smaller receptacle and use of said large receptacle when said seat is mounted on said enclosure.

4,621,381

KNOCKDOWN SOFA

Joseph L. Schramek, 9294 78th Pl., Seminole, Fla. 33543

Filed Aug. 12, 1985, Ser. No. 764,308
Int. Cl.[4] A47C *17/00*
U.S. Cl. 5—51 B **7 Claims**



1. An article of furniture of the type that can be assembled and disassembled, comprising:

a generally rectangular base portion including a pair of laterally spaced side base members;

each of said side base members having a medial portion; a front corner base member and a rear corner base member;

a pair of laterally spaced side wall members;

a pair of laterally spaced end wall members;

a depending tongue member formed on each of said side wall members;

a groove formed in each of said side base members corresponding in configuration and dimension to an associated tongue member;

a depending tongue member formed on each of said end wall members;

a mounting block member releasably secured to preselected ones of said corner base members;

each of said mounting block members configured and dimensioned to releasably receive a tongue member depending to its associated end wall member;

a pair of cap members configured and dimensioned to releasably engage preselected ones of said corner base members;

said mounting block members and said cap members being interchangeably positioned when said side wall members of said sofa are interchanged;

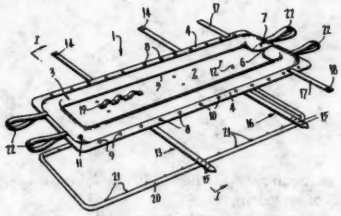
a pair of slot means formed in each of said side base members, a first one of said slot means formed between a rear corner base member and said medial portion of said side base member, and a second one of said slot means formed between a front corner base member and said medial portion of said side base member.

4,621,382

RESCUE SUPPORT MEMBER

Richard R. Burriss, 7 Adelaide St., and Henry C. H. Alsop, 18 Naples St., both of Mornington, Victoria, Australia (3931)

Filed Sep. 12, 1984, Ser. No. 649,821
Claims priority, application Australia, Jul. 18, 1984, PG6070
Int. Cl.[4] A61G *1/00*; B63C *9/04*
U.S. Cl. 5—82 R 13 Claims



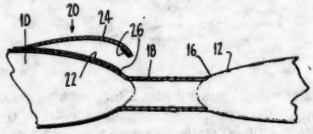
1. A rescue support member adapted for use and co-operation with a stretcher frame, for carrying or transporting a patient from a water environment, said support member comprising a central portion; an inflatable portion; and a peripheral edge portion; said peripheral edge portion having eyelets adapted to engage over corresponding receiving means suitably positioned around said stretcher frame and shaped to allow engagement of said eyelets over said receiving means when said inflatable portion is not inflated and which prevents disengagement of said eyelets from said receiving means when said inflatable portion is inflated; said inflatable portion being positioned between said central portion and said peripheral edge portion and surrounding at least a majority of said central portion, and which, upon inflation secures said support member to said stretcher frame to form a rescue stretcher and imparts buoyancy to said rescue stretcher; said central portion being adapted to receive and retain the patient when said patient is located on said support member.

4,621,383

METHOD AND APPARATUS FOR INFLATING AN ARTICLE

Christopher Gendala, 24 Broadway, Elwood, Victoria, 3184, Australia

Filed Feb. 7, 1985, Ser. No. 699,433
Claims priority, application Australia, Feb. 9, 1984, PG3545; May 1, 1984, PG4777
Int. Cl.[4] F17C *5/00*
U.S. Cl. 5—454 6 Claims



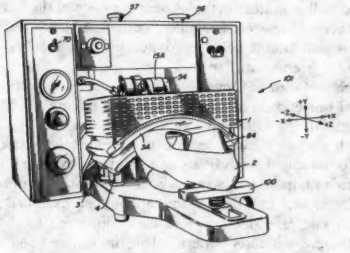
1. An inflatable article having a deformable member having an opening therein for allowing air to enter the member, said member being coupled to the article by a stem located between the article and deformable member such that when the member is deformed fluid is forced from the member into the article via the stem to inflate the article wherein said stem is made from a material which is stronger than the material from which the deformable member is made, said stronger material allowing the stem to be deformed such that said deformable member can be rolled up and said stem rolled about said deformable member to protect the deformable member.

4,621,384

STEAM TOE PRESS

William Walega, Hollis, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Dec. 30, 1985, Ser. No. 814,828
Int. Cl.[4] A43D *11/00, 95/00*
U.S. Cl. 12—54.2 12 Claims



9. A steam press for steaming the toe region of a footwear upper, that comprises:

a contoured activator to receive the toe portion of the upper and operable to heat and apply steam to said toe portion, which contoured activator include contoured porous means to engage the top of the upper, and a heated activator housing contoured to the contour of the contoured porous means and positioned to mate with the contoured porous means and press the upper therebetween a mechanical linkage connected to move said contoured porous means from and toward the heated activator housing respectively to receive the upper and then press the upper therebetween, and a steam generator connected to receive water in the liquid state and operable to convert the water steam; and

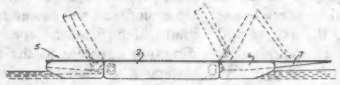
a water injector mechanism connected to introduce a metered and controllable amount of water to the steam generator which converts the water to steam that flows into the contoured porous means and thence to the upper.

4,621,385

AMPHIBIOUS VEHICLE THAT CAN BE USED AS AN INDEPENDENT FERRY AND ABLE TO FORM A PONTOON BRIDGE

Jean Gillois, Viroflay, France, assignor to Chaudronnerie et Forges d'Alsace - C.E.F.A., Soultz Sous Forêts, France

Filed Sep. 4, 1984, Ser. No. 646,927
Claims priority, application France, Sep. 19, 1983, 83 14859
Int. Cl.[4] E01D *15/14, 15/12*
U.S. Cl. 14—2.4 12 Claims



1. In an amphibious vehicle of the type having a hull equipped with retractable wheels and inflatable lateral, longitudinal floats for crossing stretches of water, and having two series of ramps hinged to the front walls of said hull which, in the folded position rest on the upper wall of said hull and, in the unfolded position, extend the upper wall of said hull, the improvement wherein:

the length of each of said lateral hull floats corresponds to the length of said hull;

each of said lateral hull floats have, connected to the surface thereof which is uppermost when inflated, a lateral hull

flap, said lateral hull flap being hinged to said hull in a manner such as to occupy a horizontal position extending the upper wall of the hull in the inflated position of said lateral hull floats, said lateral hull flaps having a length slightly less than that of said hull, whereby each said lateral hull float acts as an elastic recall system between said hull and the corresponding said lateral hull flap when deflated;

said hull includes portholes near the ends of the lateral walls thereof between the ends of said lateral walls and the ends of said lateral hull flaps when in the folded postition of said lateral hull flaps;

each said series of ramps includes a first ramp section hinged at one end thereof to said hull and having a width corresponding to the width of said hull;

each said first ramp section is equipped with two lateral, longitudinal ramp floats of a length corresponding to said first ramp section so as to come to rest on the corresponding lateral hull float in the inflated and unfolded position;

each said lateral ramp float has, connected to the surface thereof which is uppermost in the inflated and unfolded position, a ramp flap, each said ramp flap being hinged to said corresponding first ramp section in a manner such as to occupy a horizontal position extending the upper surface of said first ramp section in the inflated and unfolded position thereof; and

each said lateral ramp float is retractable, in the deflated position, between the corresponding said ramp flap and said first ramp section.

4,621,386

SCRAPER RINGS

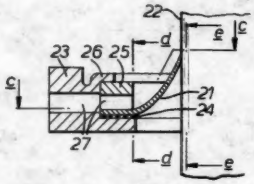
Alfred Hill, Bath, England, assignor to AEPLC, Rugby, England

Filed Nov. 27, 1984, Ser. No. 675,201

Claims priority, application United Kingdom, Nov. 30, 1983, 8331998

Int. Cl.⁴ E21B *33/08*

U.S. Cl. 15—104.01 R **21 Claims**



1. A scraper ring system for removing fluid from a relatively moving cylindrical surface said system comprising a plurality of overlapping blades each of said blades having a contact edge arranged to press against said cylindrical surface at an acute angle to the axis of said cylindrical surface, the apex of said acute angle pointing in a direction opposite to the relative motion of said cylindrical surface when material is to be removed therefrom; said blades forming part of a continuous strip.

4,621,387

DENTAL BRUSHING AID

Anne M. Noser, 1229 West Center St., Rochester, Minn. 55901

Division of Ser. No. 572,834, Jan. 23, 1984, Pat. No. 4,558,483, which is a continuation-in-part of Ser. No. 467,785, Feb. 18, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 764,732

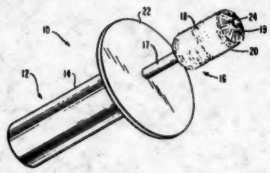
Int. Cl.⁴ A46B *5/02, 15/00*

U.S. Cl. 15—167 R **11 Claims**

1. A dental brushing aid comprising:

(a) handle means including an easily graspable gripping portion;

(b) a terminal end portion, carried by said handle means, including brush means substantially circumferentially surrounding said end portion wherein said terminal end portion includes a central stem, and wherein said brush



means comprises bristles radiating outwardly from all sides of said stem;

(c) an enlarged portion disposed between said gripping portion and said end portion, said enlarged portion being adapted to prevent said end portion from blocking the air passage of a user of the aid.

4,621,388

WATERPROOF SCOURING GLOVE WITH FLANGE

Thomas V. Ortolivo, 2211 NW. 41st Ave., Coconut Creek, Fla. 33066

Continuation-in-part of Ser. No. 642,083, Aug. 20, 1984, which is a continuation-in-part of Ser. No. 452,195, Dec. 22, 1982, abandoned. This application Dec. 10, 1984, Ser. No. 679,930

Int. Cl.⁴ A47L *25/00*

U.S. Cl. 15—227 **5 Claims**

1. A waterproof scouring glove for cleaning rigid surfaces and having a flexible body including a palm a thumb, and finger stalls, the finger stalls including a second row of phalanges in the mid-finger area, the scouring glove comprising:

an exterior palm side and an exterior knuckle side,

a plurality of abrading or cleaning units defining cleaning surfaces and adhered to only said exterior palm side and only said exterior knuckle side of said second row of phalanges and positioned entirely within the confines thereof,

whereby, the second row of phalanges may be utilized for forcibly applying pressure to said cleaning unit during scrubbing of a rigid surface when said glove is in the position of a clenched fist and, during such clenching, the second row of phalanges are capable of forcefully applying reciprocating action upon the rigid surface,

said abrading or cleaning units including a single upper exterior palm cleaning surface covering substantially the entire upper exterior palm and exterior palm side finger areas of the glove body; and

a single lower exterior palm cleaning surface covering substantially the entire lower palm area extending from the natural transverse crease in the palm to the top of the wrist, wherein said upper and said lower cleaning surfaces are separated by a transverse linear gap free of abrading or cleaning units disposed substantially at the location of the natural transverse crease of the palm;

whereby the capacity of the user to form a tight, clenched fist is enhanced by reason of such transverse linear separation between said upper and lower palm surfaces,

an absorption layer disposed between said cleaning surfaces and the flexible glove body;

a lower cleaning surface covering substantially the entire lower palm area extending from the natural transverse crease in the palm to the top of the wrist, wherein said upper and lower cleaning surfaces are separated by a transverse linear gap disposed substantially at the location of the natural transverse crease of the palm;

whereby the capacity of the user to form a tight, clenched fist is enhanced by reason of such transverse linear separation between said upper and lower palm surfaces,

whereby said absorptive layer may absorb water of a liquid solution of detergent for usage in combination with said cleaning surfaces;

said absorptive layer is adhered to the flexible glove body with a pressure-responsive adhesive, a wall around at least a portion of said abrading or cleaning units.

4,621,389

WINDSCREEN WIPER DEVICE

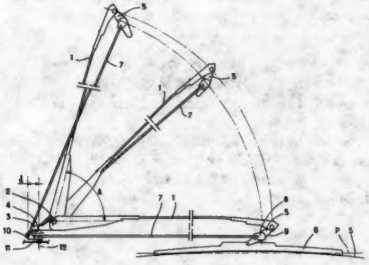
Regis M. Grare, Gif Sur Yvette, France, assignor to Equipements Automobiles Marshall, Issy-Les-Moulineaux, France

Filed Apr. 2, 1985, Ser. No. 719,118

Claims priority, application France, Apr. 6, 1984, 84 05500

Int. Cl.[4] B60S *1/34, 1/40*

U.S. Cl. 15—250.23 **14 Claims**



11. A windscreen wiper device for wiping a windscreen surface having a center plane, said device comprising:

a drive shaft adapted to be mounted for rotation about an axis substantially orthogonal to the center plane of the surface to be wiped;

at least one wiper blade;

a main wiper arm having a first end and a second end;

a drive hub for said main wiper arm;

a hinge pin pivotally connecting the first end of said main wiper arm to said drive hub;

said drive hub being adapted to be secured to said drive shaft for driving the wiper arm in response to rotation of the shaft;

rocker means carried by the second end of said wiper arm;

means pivotally connecting said rocker means to said wiper arm;

means pivotally connecting said wiper blade to said rocker means;

an auxiliary arm having first and second ends;

means pivotally connecting said first end of the auxiliary arm on said rocker means;

a clevis joint mounted for rotation around an axis substantially parallel to but offset from the axis of the drive shaft in a direction generally transverse to the length of the wiper arm;

clevis pin means pivotally connecting said second end of said auxiliary arm to said clevis joint for pivotal movement about an axis substantially parallel to the axis of said hinge pin for said main wiper arm so that during oscillation of the main wiper arm the rocker means rocks and displaces the blade longitudinally of the main wiper arm to Produce a non-circular wiping path of the blade;

said clevis pin means being spaced relative to the axis of rotation of the clevis joint, in a direction longitudinally of the wiper arm, by a distance to enable the assembly of the wiper arm, auxiliary arm, and wiper blade to be lifted substantially from the surface to be wiped by pivoting around said hinge and clevis pin means, without interference of the arms and rocker means with each other;

wherein said axis of rotation of said clevis joint is in a plane which passes through the axis of said drive shaft and when the blade engages the surface to be wiped, is orthogonal to the longitudinal direction of the main wiper arm;

wherein said clevis comprises an outward extension on the side of the axis of rotation of the clevis joint on which the clevis pin means is spaced, and the clevis pin means is mounted on said extension; and

wherein said clevis comprises recess means for accomodating and guiding a portion of the auxiliary arm adjacent said second end, when said wiper blade is in a position engaging the surface to be wiped.

4,621,390

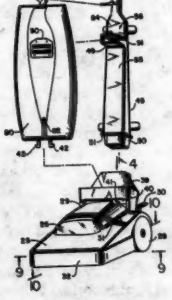
VACUUM CLEANER ASSEMBLY

Leonard Hampton, Normal, and Samuel E. Hohulin, Lexington, both of Ill., assignors to National Union Electric Corporation, Bloomington, Ill.

Filed Oct. 9, 1984, Ser. No. 659,166

Int. Cl.[4] A47L *9/14*

U.S. Cl. 15—351 **13 Claims**



1. In an electric vacuum cleaner comprising a floor engaging unit and a handle assembly pivotally connected to the floor engaging unit, the floor engaging unit having an outlet port and a vacuum source connected to direct air to said outlet port, said handle assembly comprising a base pivotally connected to

the rear of said floor engaging unit and a hollow handle, said base defining a channel, a flexible tube interconnecting said outlet port of said floor engaging unit and one end of said channel, said hollow handle being received in the other end of said channel the improvement wherein said hollow handle has an upper port spaced from said base and directed forwardly of said hollow handle, and further comprising a porous bag mounted on said handle assembly forwardly of said hollow handle with said upper port extending into said porous bag, said porous bag having upper and lower ends and a releasable closure enabling access to the interior thereof and to said upper port, means releasably holding said lower end of said porous bag to said base forwardly of said channel, and resilient hanger means holding said upper end of said porous bag to said handle above said upper port, and a filter bag within said porous bag and coupled to said upper port.

4,621,391

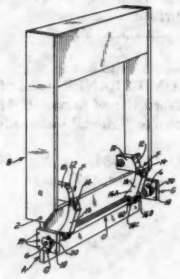
TORSION SPRING MOUNTING STRUCTURE FOR ENSURING PROPER TORSION SPRING ORIENTATION

George H. Leonard, Darien, Conn., assignor to Airpot Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 696,344, Jan. 30, 1985, abandoned. This application Apr. 12, 1985, Ser. No. 722,754

Int. Cl.⁴ E05F *1/10*

U.S. Cl. 16—299 **13 Claims**



1. In combination, a torsion bar assembly and mounting means therefor, said torsion bar assembly being adapted to resiliently affect relative movement of first and second parts and comprising a torsion element one point of which is operatively connected to a pair of interengaging operatively inner and outer toothed elements the relative positioning of which is adjustable, the operatively outer toothed element being adapted to be operatively connected to the second of said parts in a predetermined relative position, another point of said torsion element being adapted to operatively connected to said first part, said mounting means comprising a structure operatively connected to said second part and defining a recess into which said operatively outer toothed element is adapted to be received, first means carried by said torsion bar assembly, operatively connected to said toothed elements, and effective to retain said toothed elements in engagement in predetermined relative position, and second means carried by said assembly, operatively engageable with said mounting means and said outer toothed element, and effective to prevent said operatively outer toothed element from being received in said recess in an undesired relative position.

4,621,392

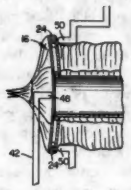
STUFFING APPARATUS AND METHOD

Vytas A. Raudys, Chicago, Ill., assignor to Viskase Corporation, Chicago, Ill.

Filed May 10, 1985, Ser. No. 732,598

Int. Cl.⁴ A22C *11/50*

U.S. Cl. 17—49 **15 Claims**



10. A stuffing method for producing encased products having substantially flat ends comprising the steps of:

(a) providing leading and trailing annular discs arranged face to face with their adjacent inwardly facing surfaces in close proximity and releasably connected, and coaxially disposing said discs on a stuffing tube and within a casing supply also coaxially disposed on the stuffing tube.

(b) moving said annular discs forwardly along and positioning said discs at a preset location proximate said stuffing tube discharge end;

(c) while said joined discs are at said preset location, applying a pressing force against them and warping at least one of said discs relative to the plane of the connection between said discs, thereby weakening the connection for subsequent separation of the discs, and then removing said pressing force;

(d) stuffing a food product under pressure into casing drawn forwardly from said casing supply; and during step (d)

(e) holding said trailing disc at said preset location and leaving said leading disc free to separate from said trailing disc while passing said casing coaxially over said trailing disc, and separating said leading disc from said trailing disc and moving said leading disc longitudinally away from said stuffing tube discharge end responsive to said food product entering and stuffing said casing.

4,621,393

BUTT JOINTING ASSEMBLY

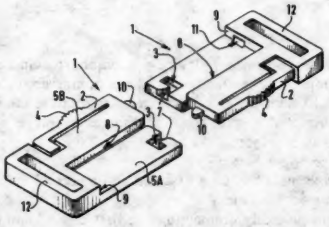
Gilbert Ambal, Frepillon, France, assignor to ITW de France, Beauchamp, France

Filed Sep. 26, 1985, Ser. No. 780,166

Claims priority, application France, Sep. 10, 1984, 84 15472

Int. Cl.⁴ A44B *11/10*

U.S. Cl. 24—171 **5 Claims**



1. A butt-jointing buckle assembly of two identical buckle parts, each buckle part comprising a strap receiving base member and two plate members integrally formed at their inner end with said base end extending side-by-side in an offset relation-

ship and in a generally parallel direction from said base, said plate members being longitudinally disposed from said base on opposite sides of the longitudinal axis, one of said plate members including an elastic pawl integrally connected at its outer end in a flexible manner with its free end extending toward said inner end of said one plate member, said free end of said elastic pawl having a projection crossing an imaginary plane defined by said other plate member, a retaining slot formed inwardly of the outer end of said other plate member and a ramp surface formed at the outer end of said retaining slot, said slot and said projection being located in opposite facing surfaces of said two plate members and being laterally spaced an equal distance from said longitudinal axis so that the projection on an identical buckle part is adapted to engage said ramp surface and force the free end of the elastic pawl to move laterally inward as the two buckle parts are brought together and thereafter be retained in said retaining slot.

4,621,394

BUCKLE FOR A SAFETY BELT

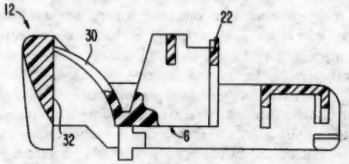
Franz Wier, Goeggingen, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 644,050

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331467

Int. Cl.⁴ A44B *11/26*

U.S. Cl. 24—642 **6 Claims**



1. A buckle for a safety belt, said buckle comprising a base plate with a guiding channel for insertion and withdrawal of a tongue, a latching member movable in a guide member mounted on said base plate and cooperating with the tongue for selective engagement and disengagement of the tongue, and a pressure key slidably mounted on said base plate and movable in a direction parallel to said guiding channel between a rest position and a depressed position, said pressure key when moving to said depressed position moving said latching member to disengage said tongue, said pressure key being biased into its rest position by at least one leaf spring member having a first end secured on said guide member and a second, free end bearing on a surface portion of said pressure key.

4,621,395

CASKET HARDWARE FOR ADJUSTING COFFIN BEDS

Roland Benoit, Danielson, Conn., assignor to Gem Industries, Inc., Gardner, Mass.

Filed Dec. 26, 1984, Ser. No. 686,417

Int. Cl.⁴ A61G *17/04, 17/00*

U.S. Cl. 27—12 **14 Claims**

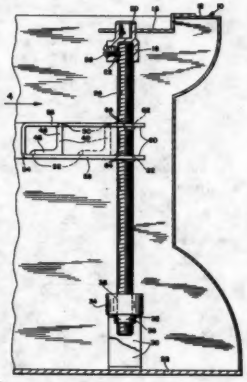
9. The combination with a casket having bottom, side and end walls, and a flat ledge on an end wall,

of an adjustable supporting device for a body supporting frame wherein the frame comprises elongated members forming sides and ends therefor, said members being interconnected fixedly and having one member adjacent to and generally parallel to the end wall of the casket having the ledge,

a flat bracket on the ledge and extending inboard of the casket, a second bracket on the floor of the casket, aligned openings in the brackets, a bushing in each opening, an upright screw shaft held at its ends in the bushings,

a third bracket comprising a two arm U-shaped member of flat stock having a closed end and an open end, aligned openings in the arms of the U-shape member, said screw shaft extending through the openings in the arms and threadingly engaging the edges of said arm openings,

the member of the body supporting frame, that is adjacent to the end wall having the ledge, being located partially in the U-shape bracket between the arms thereof and between the closed end of the U-shape bracket and the screw shaft and extending transversely of the U-shape bracket and out of the sides thereof,



said frame member partially located in the U-shape bracket being capable of linear adjustment motion between the U-shape bracket closed end and the screw shaft,

and means to turn the screw shaft,

the frame member that is located partially in the U-shape bracket being an angle iron comprising a horizontal flange and a vertical flange, the horizontal flange being located on the inner surface of one of the arms of the U-shape bracket, and the vertical flange engaging the inner surface of the other arm of the U-shape bracket.

a recess in the edge of the vertical flange of the angle iron, the said other arm of the U-shape being received therein.

4,621,396

MANUFACTURING OF SHAPED CHARGE CARRIERS

Jerry L. Walker, Fort Worth; Donald L. Crummett, Joshua, both of Tex., and William C. Behling, Duncan, Okla., assignors to Jet Research Center, Inc., Arlington, Tex. and Halliburton Company, Duncan, Okla.

Filed Jun. 26, 1985, Ser. No. 749,954

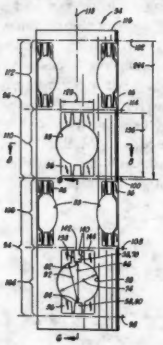
Int. Cl.⁴ B21D *51/54;* B23D *21/14;* E21B *7/00*

U.S. Cl. 29—1.3 **17 Claims**

1. A method of manufacturing a tubular shaped charge carrier, comprising the steps of:

(a) providing a generally cylindrical thin wall carrier tube; and

(b) substantially simultaneously forming a plurality of flat areas on said carrier tube in a first pattern portion of a



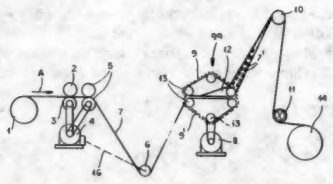
plurality of substantially identical pattern portions comprising a pattern.

4,621,397

METHOD OF AND APPARATUS FOR PRODUCING EXPANDED METAL

Hannes Schrenk, Schneeberggasse 10, A-2700 Wiener Neustadt, Austria

Filed Jul. 12, 1985, Ser. No. 754,847
Int. Cl.[4] B21D *31/04*
U.S. Cl. 29—6.1 **7 Claims**



7. A method of producing expanded metal from a strip of a metal foil having a thickness of substantially 0.65 to 0.85 mm, comprising the steps of:

conveying said strip of metal foil in a conveying direction;

cutting said strip of metal foil to provide it with intermittent cuts extending in said conveying direction;

engaging each longitudinal edge of said strip after the formation of said cuts therein between upper and lower toothed belts of a respective belt pair along each longitudinal edge positioned so that teeth of the upper and lower belts of each pair interdigitate and thereby grip the respective longitudinal edges between them; and

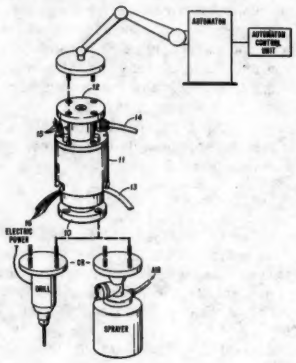
displacing the strip with the longitudinal edges thus gripped between interdigitating teeth of the belts of each pair in said direction while causing the strip between said pairs of belts to ride up a ramp progressively increasing in height and widening in said direction thereby expanding said strip.

4,621,398

AUTOMATON TOOL MOUNTING SYSTEM

William J. Kleiman, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 6, 1982, Ser. No. 446,932
Int. Cl.[4] B23Q *3/155*
U.S. Cl. 29—26 A **15 Claims**



1. A unitary mounting and coupling apparatus for joining a tool to an automaton comprising:

a. a male connector having in cooperative combination at least one pin, a first plurality of electrical contacts, a first compressed air fitting and a mounting surface; and

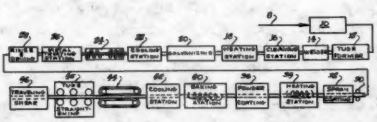
b. a cooperating female connector having at least one slot for receiving said pin, a second plurality of electrical contacts for connection with said first plurality of contacts, a second compressed air fitting for connection to said first compressed air fitting, and a mounting surface; wherein said apparatus is adapted to select and mount said tool, and couple electric and air power to said tool in a single connect operation, under control of said automaton, the choice of said power connections a function of the tool selected, in conjunction with said apparatus.

4,621,399

TUBE-COATING METHOD AND APPARATUS THEREFOR

Gulzar A. Qureshi, Tinley Park; Daniel P. Morrison, Hazel Crest; Humberto A. Hijuelos, East Hazel Crest, and Lawrence P. Vollmuth, Wheaton, all of Ill., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Dec. 18, 1985, Ser. No. 810,917
Int. Cl.[4] B21B *15/00*; B23K *1/20*
U.S. Cl. 29—33 D **11 Claims**



1. A method for making endless lengths of specialty coated metal tubing, which method comprises:

forming metal strip into tubing as such strip moves along a straight-line longitudinal path;

continuously welding adjacent lateral edges of said moving strip to complete the tubing;

cleaning the exterior surface of said moving tubing and drying said cleaned exterior surface,

heating said cleaned and dried tubing to a temperature of at least about 120° F.,

passing said heated tubing through a powder coating region and applying a layer of thermoplastic material having flakes dispersed there throughout, said layer uniformly surrounding the circumference of said tubing and having a thickness of at least about 2 mils,

said coating region containing a particulate fluidized bed comprising a mixture of thermoplastic particles of a size between about 10 microns and about 80 microns and flakes of metallic material or of pearlescent material, said flakes constituting between about 5 and 10 weight per cent of the particulate material constituting said fluidized bed;

automatically isolating said fluidized bed region from said longitudinal path of said tubing in the case of occurrence of a malfunction within one or more of said forming, welding, cleaning and heating steps which causes a halt in the travel of said tubing; and further heating said coated tubing to assure a smooth exterior surface.

4,621,400

METHOD OF SECURING A COVER TO THE END OF A THIN-WALLED TUBE AND THE ARTICLE PRODUCED THEREBY

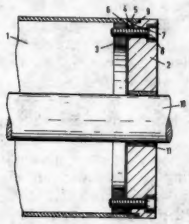
Meine H. van der Graaf, Vollenhove, Netherlands, assignor to Machinefabriek en Technische Handelsonderneming M.H. van der Graaf B.V., Vollenhove, Netherlands

Filed Aug. 23, 1985, Ser. No. 768,719

Claims priority, application Netherlands, Sep. 4, 1984, 8402697

Int. Cl.⁴ B21B *31/08*; B60B *7/04, 7/06*

U.S. Cl. 29—123 **7 Claims**



1. A method of securing a cover to the end of a thin-walled tube using a flange, comprising slidably disposing flange in the tube, restraining said flange from being pulled out of the tube by inserting a resilient ring in a shallow groove in the inner wall of the tube, mounting said cover against the end of said tube, and securing said cover to said flange with said ring thereabetween to maintain said ring in position by a supporting edge of the cover.

6. A closure construction for a thin-walled tubular member, produced by the method as claimed in claim 1.

4,621,401

RETAINING RING TOOL

J. Edward C. Anderson, Moreland Hills, Ohio, assignor to Milbar Corporation, Chagrin Falls, Ohio

Continuation-in-part of Ser. No. 669,672, Nov. 8, 1984. This application Aug. 13, 1985, Ser. No. 765,346

Int. Cl.⁴ B23P *19/04*

U.S. Cl. 29—229 **11 Claims**

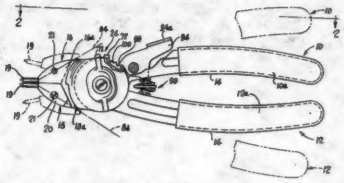
1. A snap ring plier tool including:

(a) pairs of handle and jaw sections;

(b) a pair of pivotally connected boss sections interconnecting the jaw and handle sections to provide a pair of plier parts;

(c) a spring interposed between the handles and biasing them toward an open position;

(d) one of the bosses including a coacting surface; and



(e) a lever pivotally connected to one of the handles and having a locking position engaging the spring and the coacting surface to lock the plier parts in a closed position.

4,621,402

APPARATUS AND METHOD FOR ASSEMBLING UNIVERSAL JOINTS

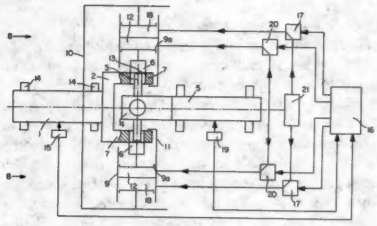
Willi Gössmann, Niederwerrn; Gebhard Pape, Schweinfurt; Norbert Klupfel, and Josef Stark, both of Hambach, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 650,532

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333666

Int. Cl.⁴ B23Q *17/00*; B21D *53/10*

U.S. Cl. 29—407 **6 Claims**



1. A method for assembling universal joints comprising a shaft secured to a joint fork having fork arms adapted to receive a joint cross and mounting bearings, wherein a joint cross positioned in said fork arms is to be secured in said joint fork by pressing mounting bearings into said fork arms and onto said joint cross, comprising the steps of:

providing a main pressure system to each of said fork arms adapted to press said bearings into said fork arms;

simultaneously pressing said bearings into said fork arms;

sensing the alignment of said joint fork and generating an alignment signal reflective of said joint fork alignment;

determining the corrective force necessary to return said joint fork to a predetermined alignment in response to said alignment signal and generating a corrective force signal reflective of said corrective force; and

changing the pressure in at least one of said main pressure systems in response to said corrective force signal such that a difference in pressure equal to said corrective force exists between said main pressure systems, whereby said joint fork is returned to said predetermined alignment.

4,621,403

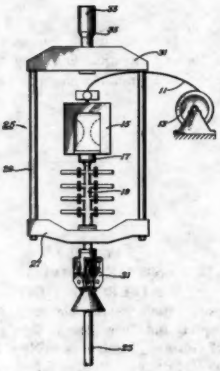
APPARATUS AND METHOD FOR INSERTING COILED TUBING

Richard C. Babb, Houston, Tex., and Tommy K. Griffin, Lafayette, La., assignors to Hughes Tool Company, Houston, Tex.

Filed May 18, 1984, Ser. No. 611,648

Int. Cl.[4] B23P *19/04;* E21B *23/00, 31/00;* F16L *55/00*

U.S. Cl. 29—433 9 Claims



1. An apparatus for inserting coiled tubing into a drill string, comprising:

a coiled tubing injector head; and

a quick connect coupling, connected below the coiled tubing injector head, said coupling having a tubular housing adapted to be slipped over the upper end of the drill string, a plurality of circumferentially spaced dogs within the housing and pivotable between inner, extended positions, wherein the dogs engage the drill string, and outer, retracted positions, said dogs having inner cam surfaces engageable with the upper end of the drill string to pivot the dogs outwardly into the retracted positions as the housing is slipped over the upper end of the drill string, and retracting means for pivoting the dogs into the retracted positions to cause the dogs to disengage the drill string when it is desired to remove the housing from the upper end of the drill string.

6. A method of inserting coiled tubing into a drill string, comprising the steps of:

connecting a coiled tubing injector head to a quick connect coupling, said coupling having a tubular housing, a plurality of circumferentially spaced dogs within the housing, and retracting means for pivoting the dogs into retracted positions;

lowering the coupling onto the upper end of the drill string, so that the drill string engages inner cam surfaces on the dogs to pivot the dogs outwardly into the retracted positions;

lowering the coupling further onto the drill string, until the dogs pass below a shoulder on the drill string and pivot to inner extended positions to lock the coupling onto the drill string; and

actuating the injector head to push the coiled tubing through the coupling into the drill string.

4,621,404

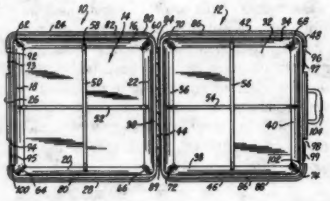
PROCESS FOR MAKING MOLDED WHEELED LUGGAGE

Arthur J. Browning, P.O. Box 4508, Toms River, N.J. 08754-4508

Division of Ser. No. 594,122, Mar. 28, 1984, Pat. No. 4,550,813. This application Aug. 12, 1985, Ser. No. 764,635

Int. Cl.[4] B21D *39/02;* A45C *13/26*

U.S. Cl. 29—463 4 Claims



1. A process for making a light-weight, strong, molded, rigid plastic luggage comprising the steps of: molding foamed or unfoamed plastic and forming a first molded one-piece plastic section and a second molded one-piece plastic section adapted to cooperate with each other, each of said sections including a side panel, four integrally molded, sloping walls having sloping curved corners and angled edges projecting upwardly from and enclosing said side panel, integrally molded support means disposed on the side panel of at least one of said sections extending up said walls towards said angled edges substantially midway between the ends of said walls, integrally molded butt hinge means and a reinforcing rib disposed on the periphery of one of said walls and a plurality of shaped recesses for receiving the cooperating halves of locks or catches disposed on the wall directly opposite, the wall provided with the butt hinge means of at least one of said sections also being provided with at least two integrally molded feet located in the vicinity of the ends of and opposite said butt hinge means; three of the walls of said second section being provided with a pair of peripheral parallel ribs forming an offset groove extending continuously around and near the periphery thereof and three of the walls of said first section being provided with an offset tongue including a supporting rib which extends continuously around and near the periphery thereof, the butt hinge means on said first and second sections being positioned thereon so that they interleave with each other and form a continuous passageway for reception of a hinge pin, said offset tongue and said offset groove being positioned on the respective sections so that they mate and said shaped recesses being positioned on the respective sections so that they are located across from each other when said sections are assembled in cooperative relationship, placing said sections on a jig and forming openings therein for the reception of metallic hardware, attaching said hardware to said sections, disposing said sections in cooperative relationship and inserting said hinge pin in said passageway formed from the interleaving of the first and second butt hinge means.

4,621,405

DRIVE MECHANISM FOR THE MAIN SPINDLE OF A ROTATING TOOL TURRET MACHINE

Peter H. Cook, Wivenhoe, and Derek W. Hillyard, Colchester, both of England, assignors to The 600 Group Public Limited Company, Middlesex, England

Filed Aug. 29, 1983, Ser. No. 527,083

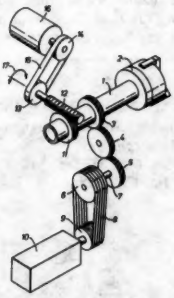
Claims priority, application United Kingdom, Sep. 3, 1982, 8225097

Int. Cl.[4] B23B *19/02*

U.S. Cl. 29—48.5 R 1 Claim

1. A drive mechanism for the main spindle for a rotating tool turret machine, including a worm, a worm wheel, and a drive motor for driving said worm in engagement with said worm

wheel of the main spindle, said worm being adjustable into and out of engagement with the worm wheel, adjustable shifting means including a bush for adjustably shifting said worm in an arcuate path and including an eccentric mounting whereby engagement and disengagement of said worm and said worm wheel is affected by rotation of said shifting means, stop means



for limiting the rotation of said shifting means, and fine adjustment means for adjusting the position of said stop means relative to said shifting means, said fine adjustment means including a carbide insert mounted on said stop means and a screw supported by said shifting means having a ball engaged between said screw and said carbide insert.

4,621,406

ELECTRONIC COMPONENT INSERTION APPARATUS

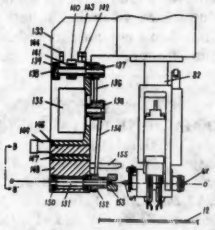
Koji Fujiwara, Nara, and Yoshinobu Maeda, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1984, Ser. No. 582,967

Claims priority, application Japan, Feb. 28, 1983, 58-32235; Dec. 5, 1983, 58-229316

Int. Cl.[4] H05K *3/32*

U.S. Cl. 29—564.2 **9 Claims**



1. In an apparatus for processing electronic components having a pair of axially projecting leads by cutting and bending the leads and thereafter inserting said leads into a corresponding pair of preformed holes in a printed circuit board in a particular, preselected location and orientation relative to said board comprising a head for working the leads of the component and for inserting the worked leads into the printed circuit board, including first and second sets of lead working and inserting tools, means mounting said sets of tools in said head for adjustment relative to each other about a centerline of said head in accordance with the required spacing between said corresponding pairs of preformed holes in the printed circuit board, means on said head and operatively connected to said sets of tools for adjusting the spacing between the same during selected cycles of the machine, a machine control for moving said head between a standby position, to a feed position in which said head receives a component for lead working and subsequent insertion of the leads into the printed circuit board, and to an insertion position wherein the lead inserting tools are oriented relative to the printed circuit board for insertion of the leads into the printed circuit board, the improvement comprising: a tool spacing adjustment drive, means mounting said drive on said machine remote from said head, means for moving said drive between a clearance position removed from the path of movement of said head and an operative position in engagement with said head when said head is in said standby position, said drive including means operatively connected to said tool adjusting means in said head when said head is in said standby position for connecting said drive to said tool spacing adjustment means whereby the spacing between the first and second sets of lead working and insertion tools is adjusted to correspond to the spacing between the corresponding preformed holes in the printed circuit board.

4,621,407

BODY FOR MACHINING CENTER

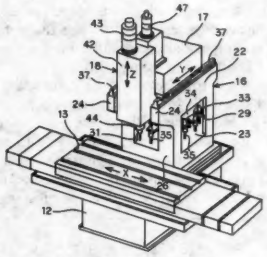
Yasuhiro Suzuki, Mishima, Japan, assignor to Fuji Seiki Machine Works, Ltd., Shizuoka, Japan

Filed May 22, 1984, Ser. No. 612,931

Claims priority, application Japan, Jul. 15, 1983, 58-108900[U]

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **6 Claims**



1. A machining center comprising:

a stationary table support;

a work table supported on said table support for movement within a substantially horizontal plane, said work table defining thereon an upper surface adapted for positioning of a workpiece;

a boxlike body stationarily positioned adjacent one side of said work table, said boxlike body defining therein an interior chamber disposed at an elvation above the upper surface of the work table, said boxlike body including a pair of upright sidewalls which project upwardly a substantial distance above the upper surface of said work table and define said interior chamber therebetween, said sidewalls projecting transversely away from the work table;

tool exchange and supporting means movably positioned wholly within said interior chamber at an elevation above the upper surface of said work table, said means including a support movable along a path and adapted to have a plurality of tools stored thereon in spaced relationship along said path;

said boxlike body having an upright front wall disposed closely adjacent said one side of said work table and projecting upwardly above said upper surface, said front wall having a gatelike opening extending therethrough for direct communication with said interior chamber to provide access to said tool exchange and supporting means, said opening projecting upwardly through an upper edge of said front wall, and said gatelike opening being disposed at an elevation above the upper surface of said work table;

each said sidewall ahving an elongated, cantilevered, protruding wall portion which projects forwardly beyond said front wall at an elevation substantially above said upper surface so as to directly overhang and be vertically spaced upwardly from the upper surface of said work table, said protruding wall portion being fixedly associated with its respective said sidewall, and the protruding wall portions of said sidewalls being sidewardly spaced apart and defining a slotlike region which opens downwardly therebetween, said slotlike region being in communication with said gatelike opening;

slide means slidably supported on said boxlike body structure above said interior chamber for linear slidable displacement along a substantially horizontal direction which substantially perpendicularly intersects said front wall, said slide means and said boxlike body structure having opposed bearing means thereon for supporting said slide means for movement along said horizontal direction, said bearing means including opposed portions which cooperate between said slide means and the protruding wall portions adjacent the outer free ends thereof;

said sidewalls and the respective protruding wall portions defining thereon upper edges which are disposed at an elevation substantially above said upper surface and above said interior chamber, said upper edges projecting substantially along said horizontal direction, said bearing means which cooperate between said slide means and said sidewalls being positioned substantially along said upper edges;

tool-supporting spindle head means slidably supported on said slide means adjacent a front face thereof for linear reciprocal movement along a substantially vertical axis, said spindle head means being disposed so as to project vertically downwardly between the protruding wall portions of said sidewalls for access to a workpiece mounted on said work table, said spindle head means being movable rearwardly along said horizontal direction in response to rearward movement of said slide means so that said spindle head means can pass through said gatelike opening for access to said tool exchange and supporting means.

4,621,408

SEQUENTIAL PHASE CONVERTIBLE MACHINE

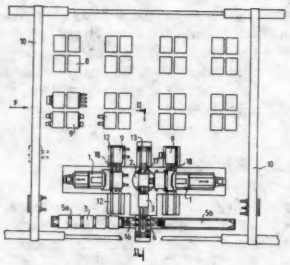
Gino Gabrielli, Paris, France, assignor to Automobiles Citroen, Seine and Automobiles Peugeot, Paris, both of, France

Filed Feb. 6, 1985, Ser. No. 698,764

Claims priority, application France, Feb. 10, 1984, 84 02788

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **8 Claims**



1. A sequential phase convertible machine comprising two machining units placed opposite each other, a machining table between said units which is provided with an indexable rotary plate and means for fixing the workpieces to be machined, conveyors adapted for moving supports on which the workpieces to be machined are fixed, a magazine of machining heads adaptable to the machining units, and transport means adapted for taking said heads from the magazine and bringing them close to the machining units and returning them then to the magazine for effecting cyclic sequential or batch machining, means forming an internal machining circuit passing by the machining table and containing respective stations for supports with their workpieces equal in number to the number of workpieces in the batch, the means forming said internal machining circuit including a lowering means for bringing a workpiece, having undergone a machining operation, to a level situated below said machining table, and a raising means for bringing said workpiece back to a level of the table.

4,621,409

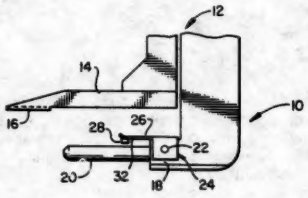
HARNESS FORMATION FINGER INTERCHANGE

Mark S. Weixel, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 6, 1985, Ser. No. 709,238

Int. Cl.[4] B23Q *3/155*

U.S. Cl. 29—568 **12 Claims**



1. A harness formation fingr interchange for use with a robotic end-effector device adapted to mount an interchangeable tool and including a tool support shaft for reception by an internal chamber within said interchangeable tool by movement of said shaft in a solely axial direction and retaining means to releasably latch said removable tool on said robotic end-effector, comprising storage means to store at least one interchangeable tool, said storage means including a housing, powered tool clamping means mounted on said housing to releasably clamp and position said tool to receive said tool support shaft, and powered latch release means mounted on said housing, said powered latch release means being operative to engage said retaining means to release the removable tool from said end effector when a mounted tool is clamped by said powered tool clamping means.

4,621,410

AUTOMATED MACHINE INSTALLATION AND METHOD

David T. N. Williamson, London, England, assignor to Molins PLC, London, England and John C. Smith, Jr., Arlington, Va.

Division of Ser. No. 85,289, Oct. 29, 1970, Pat. No. 4,369,563, which is a continuation of Ser. No. 695,817, Dec. 4, 1967, abandoned, which is a continuation-in-part of Ser. No. 636,993, May 8, 1967, abandoned, and a continuation-in-part of Ser. No. 578,318, Sep. 9, 1966, abandoned. This application Sep. 30, 1982, Ser. No. 429,918

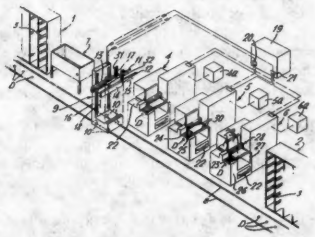
Claims priority, application United Kingdom, Sep. 13, 1965, 38937/65; May 12, 1966, 21223/66; Mar. 15, 1967, 12196/67; May 5, 1967, 21109/67

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **244 Claims**

1. The process of producing engineering components from workpieces by the removal of material therefrom by means of a plurality of data-controlled machine tools, each of which has automatic means for locating and securing thereon a common workpiece holder, said machine tools being complementary to each other in relation to the machining operations to be carried out on the workpieces; said process comprising securing each workpiece to a workpiece holder in a predetermined position and attitude with respect to the workpiece holder, delivering

each workpiece holder to storage means and storing each workpiece holder so that each workpiece is selectively accessible, selecting each workpiece holder from said storage means, presenting each of said selecting workpiece holders to a selection of said machine tools in predetermined sequence, automat-



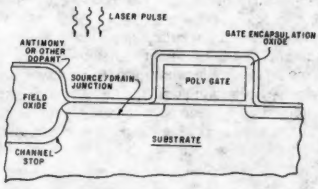
ically and sequentially locating and securing each of said selected workpiece holders at a predetermined location and attitude in each of said selected machine tools and subsequently performing programmed machining operations on said workpiece in each of said selected machine tools while said workpiece holder is so located and secured therein.

4,621,411

LASER-ENHANCED DRIVE IN OF SOURCE AND DRAIN DIFFUSIONS

Robert H. Havemann, Garland, and Vernon R. Porter, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1984, Ser. No. 656,048
Int. Cl.[4] H01L *21/263, 21/265*
U.S. Cl. 29—571 **10 Claims**



1. A method for fabricating a field-effect transistor, comprising the steps of:

(a) providing a semiconductor substrate having a surface of a first conductivity type;

(b) providing, near said semiconductor surface, a gate electrode defining a channel region in said substrate beneath said gate electrode, said semiconductor surface also containing areas for source and drain regions separated by said channel region;

(c) depositing a dopant impurity source having a second conductivity type directly on said semiconductor surface over said source and drain regions; and

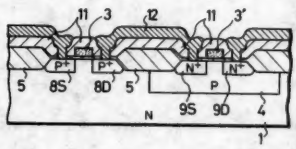
(d) illuminating said dopant with pulsed radiant heating to ionize and drive said dopant within said semiconductor surface at said source and drain regions with substantially minimal spread of source and drain diffusions underneath said gate.

4,621,412

MANUFACTURING A COMPLEMENTARY MOSFET

Kazuyoshi Kobayashi, and Yoshio Harada, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,079
Int. Cl.[4] H01L *21/425*
U.S. Cl. 29—571 **1 Claim**



1. A method for forming CMOS transistors comprising the steps of, forming a portion of a second conductivity type (**4**) in a semiconductor substrate (**1**) to form first and second portions where p and n channel CMOS transistors are to be formed, forming thin oxide layers (**2**) over said first and second portions (**1** and **4**) where said p and n channel MOS transistors are to be formed, forming thick insulating layers (**5**) on said first and second portions where said p and n channel transistors are not to be formed, applying a polycrystalline silicon layer containing phosphorous over said first and second portions, applying a first photoresist layer (**21**) on said polycrystalline silicon layer and exposing it to light to remove portions thereof, selectively etching said polycrystalline layer (**2**) using said first photo resist layer **21** as a mask to form gate electrodes (**3**, **3'**), coating the n channel transistor portion with a second photoresist layer **22**, implanting boron into said substrate to form p type source and drain regions (**8S** and **8P**) in the P transistor, removing said first and second photoresist layer (**21**, **22**), applying a third photoresist layer **23** to the p type transistor, removing said thin oxide layer **2** over the n type transistor to form source and drain forming windows, implanting arsenic ions through said windows to form source and drain regions **9S** and **9D**, forming thin oxide layers **10** on the polycrystalline gate portions **3** and **3'**, forming oxide layers **25** on the exposed n channel portion on the source and drain regions **9S** and **9D** such that the thickness of the oxide layer **25** on the silicon exposed portion of the n channel is the same as the oxide layers **2** on the source and drain (**8S** and **8D**) of the p channel transistor, applying a silicate glass layer **11** over both the n and p channel transistors, forming contact apertures for the source and drains through said silicate glass layer **11**, and forming wiring contacts on said substrate to said source and drain regions.

4,621,413

FABRICATING A SEMICONDUCTOR DEVICE WITH REDUCED GATE LEAKAGE

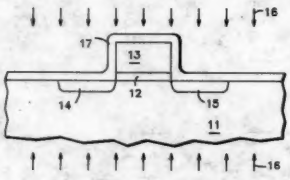
Arthur T. Lowe, Chandler; Syd R. Wilson, Phoenix, and Schyi-yi Wu, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 3, 1985, Ser. No. 740,138
Int. Cl.[4] H01L *21/477, 21/425*
U.S. Cl. 29—571 **11 Claims**

1. A method for fabricating a submicron FET device in which gate current leakage is reduced, wherein the method comprises:

forming a polysilicon gate region;

implanting dopants into the gate, and into source and drain regions adjacent to the gate;



depositing a layer of oxide over the gate, source, and drain regions; and

rapid heating of the gate, source and drain regions.

4,621,414

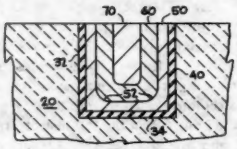
METHOD OF MAKING AN ISOLATION SLOT FOR INTEGRATED CIRCUIT STRUCTURE

Ali Iranmanesh, Mountain View, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 4, 1985, Ser. No. 707,728

Int. Cl.[4] H01L *21/31, 21/302, 21/76*

U.S. Cl. 29—576 W **19 Claims**



1. A method of making an improved isolation slot in an integrated circuit structure while minimizing damage to the silicon substrate which comprises:

(a) etching a slot in the substrate of an integrated circuit structure;

(b) depositing a polysilicon expansion buffer layer in said slot adjacent the walls of said slot; and

(c) forming an isolation oxide layer in said slot over said buffer layer of sufficient thickness to provide an electrically insulating isolation layer in said slot;

whereby the presence of said expansion buffer layer minimizes damage to said substrate by said electrically insulating isolation oxide.

4,621,415

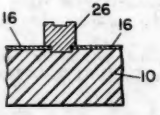
METHOD FOR MANUFACTURING LOW RESISTANCE SUB-MICRON GATE SCHOTTKY BARRIER DEVICES

Kim N. T. Tran, Union City, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 14, 1985, Ser. No. 745,283

Int. Cl.[4] H01L *21/441*

U.S. Cl. 29—589 **9 Claims**



1. A method for fabricating a Schottky gate electrode on a planar semiconductor wafer comprising the steps of:

(a) depositing a first photoresist layer directly on the upper surface of said planar semiconductor wafer; then

(b) photolithographically defining a substantially vertical line of predetermined thickness within said layer and removing the remainder of said first photoresist layer whereby said substantially vertical line of photoresist overlies a preselected area of said wafer; then

(c) depositing a dielectric layer; then

(d) removing said vertical line of photoresist and the portion of said dielectric layer thereon whereby the preselected area of the upper surface of said wafer is exposed through an opening in said dielectric layer; then

(e) depositing a second photoresist layer; then

(f) photolithographically defining a substantially vertical area of said second photoresist layer which overshadows said preselected area and removing said defined area to create an enlarged aperture in said second photoresist layer; then

(g) etching the surface of said wafer at said preselected area; then

(h) depositing a metallic layer on said second photoresist layer and said preselected area; and then

(i) removing the remainder of said second photoresist layer and the portion of the metal thereon.

4,621,416

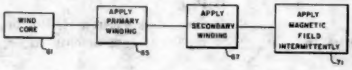
AMORPHOUS METAL TRANSFORMER WITH LOW LOSS CORE

Robert F. Krause, Murrysville, and Curtis J. Gosik, East Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 1, 1982, Ser. No. 383,399

Int. Cl.[4] H01F *7/06*

U.S. Cl. 29—606 **5 Claims**



1. A method of reducing core losses in a magnetic core comprising the steps of

(a) winding a strip of an amorphous magnetic alloy into a magnetic core;

(b) applying a primary winding onto the magnetic core to establish an AC exciting field in the core;

(c) applying a secondary winding onto the core; and

(d) intermittently applying one of a DC and a low frequency AC magnetic field to the core at an angle that is non-coincident to the AC exciting field to effect reduced high frequency core losses.

4,621,417

HYDROGEN-STORED ELECTRODE FOR USE IN BATTERY AND MANUFACTURING METHOD

Motoo Mohri, and Yoshimitsu Tajima, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1985, Ser. No. 702,608

Claims priority, application Japan, Feb. 17, 1984, 59-28872

Int. Cl.[4] H01M *4/04, 4/88;* **C01B** *6/24*

U.S. Cl. 29—623.1 **13 Claims**

1. A method for manufacturing a hydrogen-stored electrode, comprising:

blending hydrogen stored alloy material with an additive;

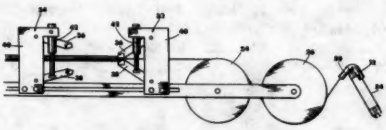
immersing said blend in a solution comprising acid or alkali to generate hydrogen gas in said solution by the chemical reaction of said additive and said solution, said hydrogen gas effecting hydrogenation and activation of said hydrogen-stored alloy material; and

internally molding said blend to obtain a hydrogen-stored electrode.

4,621,418
COIL WINDING APPARATUS

Shaul Aharony, Jabotinsky 9, Kiryat Ono, and Sammi Aharony, Lev Yafe 74, Herzlia, both of Israel

Filed May 7, 1984, Ser. No. 607,528
Int. Cl.[4] H02K *15/04, 15/10*
U.S. Cl. 29—736 **4 Claims**

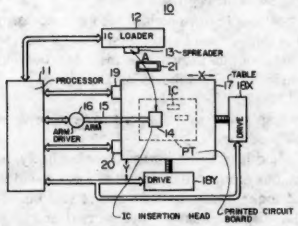


1. A coil winding machine comprising:
a spindle adapted to be driven in rotational motion and to have one or more coils wound thereupon;
wire supply means for supplying wire to said spindle for producing the wound coil;
insulative sleeve release means for selectably retaining and releasing insulative sleeves through which the wire is drawn to form the coil, such that the sleeves are properly positioned on the wound coils, said release means comprising means for selectably preventing passage of the forwardmost insulating sleeve in a row of retaining sleeves through which the wire passes and having engaged and disengaged positions; and
control means for governing the operation of the spindle and of the release means whereby release of the insulative sleeve takes place at the correct time for proper positioning of the sleeve on the coil.

4,621,419
AUTOMATIC IC MOUNTING PROCESS AND APPARATUS FOR PERFORMING THE PROCESS

Toshikatsu Hino; Fumio Arase, and Takashi Ohshima, Oyama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1984, Ser. No. 687,283
Claims priority, application Japan, Dec. 29, 1983, 58-247691
Int. Cl.[4] H05K *3/30;* **B23P** *23/00*
U.S. Cl. 29—837 **9 Claims**



1. An automatic IC mounting process for mounting a plurality of ICs via an IC insertion apparatus including a means for detecting if an IC is correctly mounted, said ICs being mounted on an upper surface of a printed circuit board having through-holes formed therein, in accordance with a predetermined sequence, each of said ICs having a plurality of leads which are to be inserted into predetermined corresponding ones of said through-holes, the process including:
(i) a step for inserting said leads of an IC into a group of said through-holes of said printed circuit board defining a mounting position;
(ii) a step for detecting whether or not each lead of said IC is correctly inserted into said corresponding through-hole after every step (i);
(iii) a step for removing a misinserted IC having a misinserted lead from said printed circuit board immediately after a misinsertion is detected in said step (ii);
(iv) a step for memorizing information for identifying said misinserted IC and the mounting position;
(v) a step for mounting a predetermined number of ICs, subsequent to said detection, on said printed circuit board in accordance with said predetermined sequence, leaving the mounting position of said misinserted IC unmounted;
(vi) a step for determining whether or not said information was memorized in said step (iv); and
(vii) a step for preparing a replacement IC identified by said information and moving it on said printed circuit board at said mounting position.

4. An automatic IC mounting apparatus for mounting a plurality of ICs on an upper surface of a printed circuit board having through-holes formed therein, in accordance with a predetermined sequence, each of said ICs having a plurality of leads which are to be inserted into predetermined corresponding ones of said through-holes, said apparatus including:
processor means for controlling said sequence and generating control signals;
spreader means for receiving and holding an IC;
IC feed means for feeding an IC onto said spreader means in accordance with one of said control signals;
conveyor means for conveying said IC from said spreader means to a position above said printed circuit board;
positioning means for positioning said printed circuit board so that said IC is positioned above a predetermined location of said printed circuit board;
IC insertion means for holding said IC, for pushing said IC toward said printed circuit board and for inserting said leads of said IC said through-holes of said printed circuit board so that said IC is mounted thereon;
detection means for detecting whether or not each IC lead is correctly inserted into said through-holes after inserting said IC by said IC insertion means, said detection means being disposed on a side of said printed circuit board opposite said IC insertion means and mounted on said positioning means;
abutment means mounted on said detection means, for abutting against said leads of said IC inserted into said through-holes of said printed circuit board;
IC removal means for removing a misinserted IC from said printed circuit board, upon the detection of a misinsertion by said detection means and for moving said abutment means so as to push said IC away from said positioning means;
memory means for memorizing information specifying said misinserted IC and corresponding mounting position; and
wherein said processor generates said control signals such that a predetermined number of ICs are mounted after said misinserted IC is removed, leaving said corresponding mounting position empty and a replacement IC is mounted on said position in accordance with said memorized information after said subsequent ICs are mounted.

4,621,420
PROCESS FOR MANUFACTURING AN ELECTRODE

Yoshinobu Takahashi; Takanobu Mori; Masamitsu Odanaka; Haruo Murase, and Masayuki Kojima, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 407,490, Aug. 12, 1982, Pat. No. 4,473,453.
This application Aug. 7, 1984, Ser. No. 617,275
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—856 **8 Claims**

1. A process for manufacturing an electrode, which comprises:
(a) inserting a metal member in the form of a bar into a cylindrical hollow metal oxide sintered mass comprising magnetite, ferrite or a mixture thereof having the lower end thereof closed;
(b) securing the metal member in the interior of the metal oxide sintered mass by means of a conductive material;

thereby exposing the metal member at the upper end portion of the sintered mass;

(c) connecting a sheathed lead wire having two ends to the exposed portion of the metal member;

(d) attaching a cylindrical hollow member of a hard resin having such a length as to cover both ends of the lead wire and the metal member at the connected portion onto the outer circumference of the upper end of the cylindrical hollow member; and

(e) filling the gap between the inner circumference of the cylindrical hollow member and the outer circumferences

of the lead wire and metal member with a liquid curable resin; and curing said resin, and wherein the upper end of the metal member is projected from the electrode body, the sheathed lead wire is connected to the projected portion of the metal member, a cylindrical hollow member of hard resin is so attached to the upper end of the electrode body so as to bridge over the joined portion, and the gap between the inner circumference of the cylindrical hollow member and the outer circumference of the electrode body and the lead wire is filled with a cured resin of a liquid curable resin.

4,621,421

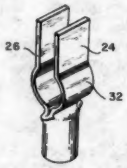
METHOD OF MAKING AN ELECTRICAL TERMINAL

Francis A. O'Loughlin, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Sep. 17, 1984, Ser. No. 651,404

Int. Cl.[4] H01R *43/16*

U.S. Cl. 29—874 **2 Claims**



1. A method of making an electrical terminal for attachment to a terminal post, comprising the steps of:

providing a selected length of tubular material;

dividing an end extent of said tubular material into two legs, each of said legs having an unsupported extent at one end thereof and being individually supported from a barrel portion of said tubualr material at an end opposite said one end;

spreading said legs;

flattening said legs; and

inserting a forming die between said legs thereby providing an arcuate portion in each of said legs complementary to said terminal post.

4,621,422

METHOD OF MANUFACTURING CONTACT SPRING SOCKETS

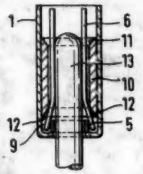
Gerhard Neumann, Waldkraiburg, and Hans Ramisch, Mühldorf, both of Fed. Rep. of Germany, assignors to Otto Dunkel GmbH Fabrik fur Elektrotechnische Gerate, Muhldorf, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,448

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412874

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—882 **3 Claims**



1. A method of making contact spring sockets, comprising the steps of:

providing a socket body having a flange at a first end of said socket body; said socket body having a generally hollow interior; said flange having an inner periphery surrounding an opening communicating with said hollow interior; said socket body having an open second end;

providing a mandrel adapted to enter said opening;

inserting said mandrel into said opening;

providing an annu'us adapted to allow entry of said mandrel;

inserting said annulus into said hollow interior and passing said annulus about said mandrel;

moving said annulus along said mandrel until said annulus abuts said flange;

providing at least one elongated contact spring; said at least one elongated contact spring having a first end, a second end, and a central portion;

inserting said at least one elongated contact spring into said hollow interior until said first end of said at least one elongated contact spring is disposed between an outer periphery of said annulus and an inner surface of said socket body;

providing an insert ring adapted to be received within said hollow interior;

inserting said insert ring into said socket body, between said at least one elongated contact spring and said inner surface of said socket body, until an end of said insert ring causes angular displacement of said second end of said at least one elongated contact spring relative to said first end, such that said second end is moved away from said inner surface;

elastically deforming said at least one elongated contact spring against an inner surface of said annulus;

providing a line connector having a conical frustrum;

inserting said conical frustrum of said line connector into said open second end of said socket body until contacting said second end of said at least one elongated contact spring;

continuing to insert said conical frustrum into said socket body until said second end of said at least one elongated contact spring abuts said inner surface of said socket body;

deforming said socket body in a region adjacent said open second end to form a shoulder to retain said conical frustrum of said line connector in said socket body.

4,621,423

SHEAR HEAD OF A DRY-SHAVER COMPRISING A SHEAR FOIL WHICH IS CLAMPED SO AS TO BE CURVED

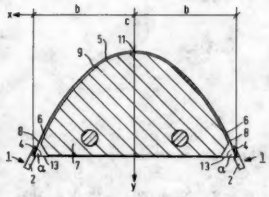
Hugo Schemmann, Schaesberg, Netherlands, and Romuald L. Bukoschek, Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 11, 1984, Ser. No. 635,392

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340661

Int. Cl.[4] B26B *19/02*

U.S. Cl. 30—43.92 2 Claims



1. A vibratory dry-shaver, which comprises a shear foil having two longitudinal edges; respective means to clamp the two longitudinal edges in place to cause the shear foil to assume a natural curvature, the tangents to such curvature at the two clamping means forming an acute angle with each other; and a cutter reciprocatingly movable along and adjacent to the shear foil, the cutting edge of the cutter having been preformed to have a curvature the same as that of the clamped, curved shear foil; the curved shear foil and the cutting edge of the cutter each having a hyperbolic cosine curvature according to the formula:

$$y = c \cdot \cos h\ x/c$$

where y indicates the distances of the individual cutting edge points from the x-axis, x is the coordinate in the direction of the width of the cutter, c is a constant determined by the point of intersection of the functions

$$f_1(c) = c + h,$$

and

$$f_2(c) = c \cdot \cos h\ b/c$$

b is half the width of the clamped shear foil and h is the height of the curvature of the clamped shear foil.

4,621,424

RAZOR BLADE ASSEMBLY

Chester F. Jacobson, Southboro, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 519,565, Aug. 2, 1983, which is a continuation-in-part of Ser. No. 419,202, Sep. 17, 1982, Pat. No. 4,492,024. This application Oct. 15, 1984, Ser. No. 660,952

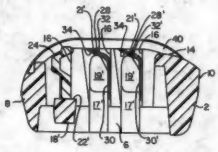
Claims priority, application Canada, Aug. 30, 1983, 435629

The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl.[4] B26B *21/22, 21/32*

U.S. Cl. 30—41 1 Claim

1. A razor blade assembly comprising a body member having first and second end portions interconnected by front and back portions, first and second frame portions interconnecting said front and back portions, said end portions having therein opposed slots, a first pair of spring fingers extending outwardly from said frame portions parallel to said front and back portions and in opposite directions, said fingers being aligned with a first pair of said slots, a second pair of spring fingers extending inwardly from said end portions, and in generally opposite directions toward one another, said second pair of spring fingers being aligned with a second pair of said slots, a third pair of spring fingers extending inwardly from said end portions, and in generally opposite directions toward one another, said third pair of spring fingers being aligned with a third pair of said slots, a guard portion mounted on said first pair of spring fingers and disposed in said first pair of slots, and first and second blade members having, respectively, first and second cutting edges parallel with each other and facing a same direction to act in tandem upon a surface being shaved, said blade members being disposed in said second and third pairs of slots, respectively and resting upon said second and third pairs of spring fingers, respectively, said first and second blade members and said guard portions each being independently mov-



able relative to the body member in response to forces encountered during a shaving operation by flexure of said spring fingers, a shaving aid fixed to one of said back and guard portions, said shaving aid being formed of a hydrophobic material and water leachable hydrophilic polymeric material, the blade assembly having pivot mounting means thereon for pivotal attachment to a razor handle assembly, whereby the blade assembly, as a whole, is pivotally movable on said handle assembly in response to forces encountered during the shaving operation, and cam means disposed on an underside of said body member and adapted to receive a cam follower mounted on said razor handle to maintain maximum contact between said surface being shaved and said independently movable first and second blade members, said guard portion, and said shaving aid.

4,621,425

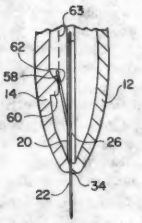
RETRACTABLE KNIFE HANDLE

Carl C. Stoutenberg, Burlington, Conn., assignor to Stanley Works, New Britain, Conn.

Filed Oct. 5, 1984, Ser. No. 658,284

Int. Cl.[4] B26B *3/06*

U.S. Cl. 30—162 12 Claims



1. A retractable knife comprising:

an elongated case having a forward blade opening;

a blade carrier slideably mounted in said case;

a blade removeably mounted to said carrier;

said blade carrier being selectively longitudinally moveable in said case between a retracted sheathed position and an extended unsheathed position wherein the mounted blade

extends through said blade opening to present a cutting edge;

biasing means extending from said blade carrier to selectively urge the blade carrier against said mounted blade; and

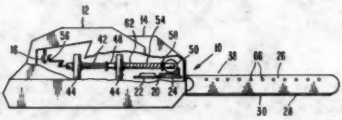
engagement means at the interior of said case for selective engagement by said biasing means so that the engagement means bears upon the biasing means when the blade carrier is in the extended position, the biasing means thereby urging the blade carrier into a clamping engagement wherein the mounted blade is clamped between the carrier and the case, and when the carrier is in the retracted position, the clamping engagement is released.

4,621,426

LOCKING COVER ASSEMBLY FOR USE WITH A CHAIN SAW

Horace L. Shivers, 21 Fillmore St., Trenton, N.J. 08638

Filed Oct. 3, 1985, Ser. No. 783,892
Int. Cl.[4] B27B *17/02*
U.S. Cl. 30—382 **10 Claims**



1. A locking cover assembly, for use with a conventional chain saw having a housing, a start trigger and a chain and bar cutting assembly, the invention comprising:

(a) a hinge means including a rear hinge member and a front hinge member pivotally secured with respect to one another, said rear hinge member being fixedly secured with respect to the housing of the chain saw;

(b) a cover means extending about the chain and bar cutting assembly and defining a cutting slot extending longitudinally along the bottom edge thereof, said cover means including a tongue means fixedly secured thereto which is secured with respect to said front hinge member to allow said cover means to be pivotally secured with respect to the housing;

(c) a cover biasing means secured with respect to said front hinge member and with respect to said rear hinge member to urge said cover means into the closed position covering the chain and bar cutting assembly; and

(d) a locking apparatus including:

(1) a plurality of guide rods fixedly secured with respect to the housing and each defining at least one guide aperture therethrough;

(2) a locking pin positioned extending through said guide apertures and being longitudinally movable therethrough between a closed position adjacent said tongue means of said cover means and an opened position adjacent to the housing;

(3) a wheel means rotationally secured to said locking pin at the end thereof adjacent to said cover means and being responsive to said locking pin being in the closed position to urge said cover means into the closed position about the chain and bar cutting assembly and being further responsive to said locking pin being in the opened position to be positioned immediately above said rear hinge member to release said cover means;

(4) a locking pin biasing means adjacent said locking pin to urge said locking pin toward the closed position; and

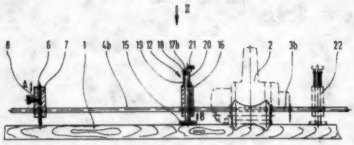
(5) a lock trigger fixedly secured with respect to said locking pin adjacent to the start trigger of the chain saw to urge said locking pin and said wheel means toward the opened position to release said cover means for upward movement thereof responsive to pulling of said lock trigger and the start trigger.

4,621,427

GUIDE DEVICE FOR A MOBILE WORKING TOOL

Otto Bergler, Mühlacker-Lomersheim, Fed. Rep. of Germany, assignor to Black & Decker Overseas AG, Vaduz, Liechtenstein

Filed Apr. 15, 1985, Ser. No. 723,059
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413928
Int. Cl.[4] B26B *3/00*
U.S. Cl. 30—481 **12 Claims**



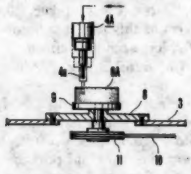
1. Guide device in combination with a mobile working tool such as a manual planing machine or a manual milling machine for processing a workpiece, said tool including a housing provided with a pair of orifices arranged transversely to the direction of advance of the tool, a pair of guide rod means extending through said orifices, respectively, to permit said housing to be slidable along both said guide rod means, first clamping means for releasably clamping said housing to both said guide rod means, a connecting piece provided with a pair of holes into which said guide rod means are inserted, respectively, to permit said connecting piece to be slidable along both said guide rod means, second clamping means for releasably clamping said connecting piece to both said guide rod means so that the distance between said housing and said connecting piece may be varied by unclamping and sliding either of said housing and said connecting piece relative to said guide rod means, a compass point carried by said connecting piece so that said pair of guide rod means and said tool may travel about said compass point as an axis of rotation, a block carried by said pair of guide rod means in spaced relation to said tool, said tool and said block being spaced in the same direction from said compass point, said block including a support surface for slidably engaging a reference surface, said support surface being adjustable in height to control the height of the tool relative to the workpiece, said block being slidable along both said guide rod means, and third clamping means releasably clamping said block to both said guide rod means.

4,621,428

PEN TIP CLEANING ASSEMBLY OF PLOTTER

Sadaaki Fukumura; Etsuji Tagami, both of Tokyo; Takeji Hashimoto, and Hirofumi Tano, both of Kyoto, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo and Dainippon Screen Mfg. Co., Ltd., Kyoto, both of, Japan

Filed Jan. 22, 1985, Ser. No. 693,395
Claims priority, application Japan, Feb. 14, 1984, 59-19701[U]
Int. Cl.[4] G01D *9/00*
U.S. Cl. 33—18.1 **12 Claims**



1. A device for cleaning a pen tip of a drawing needle pen, comprising:

a carriage for holding said needle pen thereon, said carriage

being movable in X-Y directions relative to a drawing area within which marking is made;

an elastic pad in which said pen tip is insertable therein, said pad being located at a predetermined place outside of the drawing area;

means for moving said carriage and conducting said needle pen to above said pad; and

means for altering the insertional position of said pen tip relative to said pad for every insertion, means for vertically moving said pen tip relative to said pad, such that the insertion of said pen tip is made at different positions of said pad upon every insertion, said pen tip being vertically movable within said pad, whereby foreign materials adhering to said pen tip are removed and the pen tip is cleaned upon insertion of the pen tip into said pad.

4,621,429

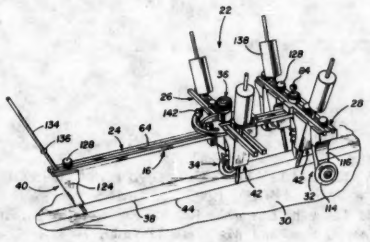
DRAFTING VEHICLE SIMULATOR

Gerald F. Alm, Rte. 1, Box 7, Grangeville, Id. 83530

Filed Jul. 31, 1985, Ser. No. 761,028

Int. Cl.[4] B43L *13/00*

U.S. Cl. 33—18.1 **34 Claims**



1. A drafting device for plotting the tracking of a wheeled vehicle having dirigible and non-dirigible road tracking wheels, said device including a wheel base beam, two axle beams, assembly means for fixedly holging the axle beams adjustably spaced from each other on the wheel base distance proportional to the wheel base length of the vehicle, wheel means mounted on the axle beams for wheeled support of the assembled beams on a road simulating surface, track recording means mounted on at least one of the axle beams for recording parallel vehicle simulating tracks on the surface in response to wheeled movement of the assembled beams on said surface and means responsive to said wheeled movement for recording a guide path on the surface equally spaced between said parallel vehicle simulating tracks.

28. In a drafting device having a vehicle simulating frame, wheel means mounted on the frame for support thereof above a ground simulating surface and means for recording a path of movement of the frame along said surface, the improvement residing in said frame including a wheel base simulating beam, at least one axle simulating beam and means interconnecting said beams at right angles to each other, each of said beams comprising a pair of bars fixedly spaced in parallel relation to each other by said beam interconnecting means, said recording means and the wheel means being mounted on the axle simulating beam.

34. In a drafting device for plotting, on a ground simulating surface, movement of a wheeled vehicle having fron and rear axles longitudinally spaced from each other by a wheel base distance (Wb), said device including a vehicle simulating frame through which a longitudinal axis extends, wheel means mounted on said frame for wheeled support thereof on the ground simulating surface and means responsive to wheeled movement of the frame on said surface for recording a path of movement thereon, the improvement residing in siad wheel means including a dirigible wheel and a pair of non-dirigible wheels mounted on the frame in laterally spaced relation to said longitudinal axis, simulation steering means mounted on the frame and connected to said dirigible wheel for angular displacement thereof about a steering axis extending in perpendicular intersecting relation to the longitudinal axis of the frame and axle simulating means connected to the frame for mounting said pair of non-dirigible wheels a distance from the dirigible wheel along the longitudinal axis proportional to the wheel distance (Wb) of the vehicle.

4,621,430

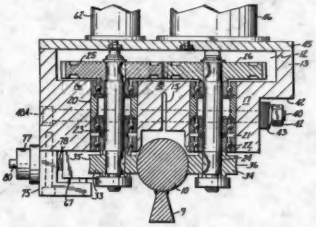
DRIVE FOR POSITION CONTROLLED LINEARLY MOVABLE CARRIAGE

John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Division of Ser. No. 575,033, Jan. 30, 1984, Pat. No. 4,555,853. This application Nov. 29, 1985, Ser. No. 803,111

Int. Cl.[4] G01B *3/12*

U.S. Cl. 33—125 M **7 Claims**



1. A carriage drive apparatus for positioning a carriage along a guide rail having a longitudinal axis, the carriage drive apparatus comprising:

a carriage drive housing,

first and second drive roller means rotatably mounted on the carriage drive housing in position to engage opposite sides of a guide rail, the first and second drive roller means adapted for frictional engaging contact with such guide rail;

said carriage drive housing comprising first and second sections, the first drive roller means being positioned on the first section and the second drive roller means being positioned on the second section;

means for resiliently urging the first and second roller means against the respective opposite sides of a guide rail on which the carriage drive housing is mounted for frictional engaging contact with such guide rail;

means coupled to the roller means to effect a drive from the carriage drive housing to a guide rail mounting the carriage drive housing to move the carriage drive housing along a guide roll on which the carriage drive housing is mounted; and

means for sensing the position of the carriage drive housing along such guide rail.

4,621,431

TELESCOPING DEVICE WITH STOP MECHANISM

Francis Fatool, Sunbury, and William R. Miller, Jr., Danville, both of Pa., assignors to Mil-Tool, Inc., Sunbury, Pa.

Filed Apr. 21, 1986, Ser. No. 855,727

Int. Cl.[4] G01B *3/08*

U.S. Cl. 33—161 **7 Claims**

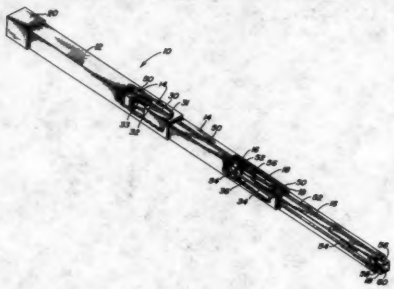
1. A telescoping device with stop mechanism, said telecoping device comprising:

(a) a plurality of telecoping tubes, each of said tubes having a proximal and a distal end and a plurality of walls, the outermost tube being a case for the interior tubes and including a cap, all of said tubes excluding said innermost tube including pin receiving means in one tube wall at said

wall's distal end, said interior tubes also each including at least one lengthwise groove, at least one said groove being in the tube wall adjacent to said wall with said pin receiving means, each of said grooves including at its proximal end a pin receiving means, said largest interior tube having one groove, and each of said other smaller interior tubes having a successive additional groove; and,

(b) two sets of pins, each set comprising the same number of pins as interior tubes,

(i) said first pin set having its pins generally right angled rods with a bend proximate one end to create a short and a long arm, said pins in said first pin set adapted to rest longitudinally one each in a groove with said short arm extending transversely through said wall pin receiving means of said next largest tube's distal end so that said short arm's end is flush to the exterior of said



next largest tube, said pins thereby held in said pin receiving means during telecoping actions; and

(ii) said second pin set, also having its pins generally right angled rods except that said second set's short arm being longer than said corresponding arm of said first set, each of said second set's pins' long arms resting longitudinally in a groove of a tube with each of said second set's pins' short arms extending transversely through said groove's pin receiving means into the hollow interior of said tube so that said second pin set's short arms act as a stop for said next smallest tube,

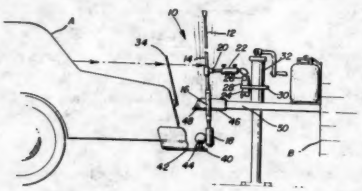
whereby, when said device is collapsed, the inward progress of each tube is stopped by the short arm of a pin of the second pin set extending through from said next larger tube, and when said device is expanded, the forward progress of each tube is stopped by the engagement of the long arms of said first and second pin sets in a groove.

4,621,432

TRAILER HOOK-UP GUIDE SYSTEM

Thomas Law, P.O. Box 1131, Biloxi, Miss. 39534

Filed Jun. 27, 1985, Ser. No. 751,312
Int. Cl.[4] G01C *5/00*
U.S. Cl. 33—264 **19 Claims**



1. Guide system for aligning and hooking-up a towing vehicle having a hitching element to a towed vehicle having a hitch element comprising

a fork-like sighting member attached to the rear of the towing vehicle above said hitching element and in vertical alignment therewith and

a flexible sighting pole assembly adjustably attached to the towed vehicle, said assembly including

a vertical sighting pole having a lower end and a longitudinal axis,

an offset U-shaped member attached to the lower end of said vertical sighting pole,

a tail section extending from said U-shaped member along said longitudinal axis on a side of the U-shaped member opposite the vertical sighting pole,

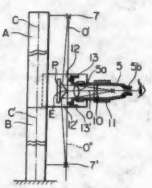
said U-shaped member being positioned to extend around said hitch element, with the tail section below the hitch element so that said longitudinal axis extends substantially vertically through the hitch element, whereby when aligning said hitching element and said hitch element for hook-up, said hitching element bumps said tail section causing the vertical sighting pole to vibrate and thereby provide an indication of proper alignment when viewed through said fork-like sighting member.

4,621,433

VERTICALITY DETECTING APPARATUS FOR PLUMBING COLUMNS

Tetsuya Takeuchi, Kawasaki; Katsuki Koshigoe, Chiba; Hiroshi Ogino, Omiya, and Masaharu Hayashi, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Sokkisha, Tokyo, Japan

Filed Sep. 18, 1984, Ser. No. 651,765
Claims priority, application Japan, Sep. 19, 1983, 58-171195
Int. Cl.[4] G01B *11/26*
U.S. Cl. 33—286 **5 Claims**



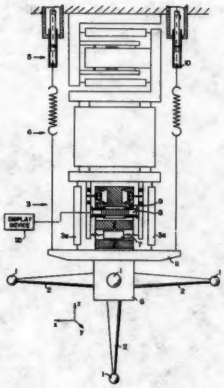
1. A verticality detecting apparatus for plumbing columns comprising: a base plate adapted to be mounted on one end portion of a first column; an assembly having a first horizontal rotary shaft rotatably mounted on said base plate, a support member fixedly secured to said first horizontal rotary shaft, a second horizontal rotary shaft rotatably mounted on said support member perpendicular to said first horizontal rotary shaft, and a measuring section fixedly secured to said second horizontal rotary shaft and consisting of a sight telescope having a right angle prism optically aligned with the objective thereof with the edge between the right angle faces of said prism on the optical axis and the angled face perpendicular thereto; an inclination sensor on said assembly for detecting inclinations of said assembly about the axes of said first and second horizontal rotary shafts; means for locking said first and second horizontal rotary shafts against rotation; a first target adapted to be mounted on the other end portion of said first column; and a second target adapted to be mounted on one end portion of a second column, the other end of which is joined to said one end of said first column.

4,621,434

MULTIPLE-COORDINATE SCANNER WITH REGULATED SCANNING FORCE

Karl-Heinz Hirschmann, Stuttgart, Fed. Rep. of Germany, assignor to Willy Höfler, Karlsruhe, Fed. Rep. of Germany

Filed Aug. 10, 1984, Ser. No. 639,288
Int. Cl.⁴ G01B *7/03*
U.S. Cl. 33—503 **7 Claims**



1. An electronic multi-coordinate scanner having a scanning head (g) having at least one scanner (1,2) for progressively scanning a multi-dimensional article (h) from one measuring position to another measuring position on coordinate measuring machines, wherein said scanning head includes a torsionally rigid sequential arrangement of straight-line X, Y and Z guide systems (3,4,5) free of play and friction which with one another form a definite, two- or three-dimensional coordinate system, and further includes signal transducers for each X-Y-Z guide system which indicate the scanner deflection, which likewise represent a torsionally rigid coordinate system, and is provided with means for electronically controlling generation of definite measuring forces of the scanner, which comprises a multi-coordinate measuring force device (6) including signal transducers disposed between scanners (1,2) and said straight-line X, Y, Z guide systems (3,4,5); each of said straight-line X,Y,Z guide system includes an electronically controlled adjusting member (7) for adjusting each said guide system within its range of movement of measuring force generation; and each straight-line X,Y,Z guide system is provided with a travel transducer (8) for indicating a deflected position of each said guide system; a computer for receiving signals from said signal transducers in accordance with the individual coordinates of said scanner and comparing said signals with a predetermined set-point value and deviation between these values are converted to output signals, adjusting members 7 associated with each of said X,Y,Z guide systems for adjusting said X,Y,Z guide system in accordance with said outputs signals received from said computer, and said travel transducers produce output signals which are directed to a display device for indicating the contour of said article.

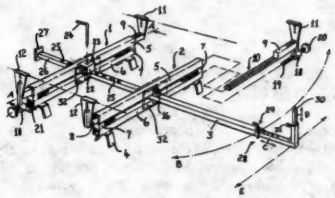
4,621,435

SILL ATTACHMENT UNDERFRAME MEASUREMENT SYSTEM

Alan V. Higginbotham, 21 Kempe Parade, Kings Langley, New South Wales 2147, Australia

Filed Dec. 14, 1984, Ser. No. 681,944
Int. Cl.⁴ G01B *5/00*
U.S. Cl. 33—520 **7 Claims**

1. Apparatus for measurement of the underframe of a motor vehicle, said apparatus comprising a first transverse member having a longitudinal extent comparable with the width of said motor vehicle, each end of said first transverse member being provided with an upwardly extending arm shaped to grip the corresponding door sill of said motor vehicle whereby said first transverse member can be suspended under said vehicle by engagement of said arms with said door sills, said transverse member being formed from two portions each longitudinally reciprocable relative to each other and inter-connected by self-centering means whereby the length of said transverse



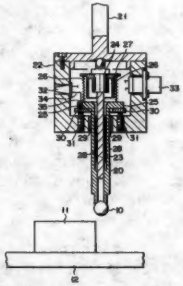
member is adjustable and said self-centering means is located at the center of said transverse member, and a longitudinal arm mounted on said self-centering means of said first transverse arm for both longitudinal and pivotal movement relative thereto whereby longitudinal movement of said longitudinal arm followed by pivotal movement of said longitudinal arm enables a direct comparison to be made between the location of one portion to one side of said vehicle and the location of the corresponding portion on the other side of said vehicle.

4,621,436

POSITION DETECTING APPARATUS

Masahiro Kurimoto, Tokyo, Japan, assignor to Sokkisha Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1985, Ser. No. 746,248
Claims priority, application Japan, Jun. 21, 1984, 59-128197
Int. Cl.⁴ G01B *7/00*
U.S. Cl. 33—561 **13 Claims**



1. A position detecting apparatus comprising:
a housing having an opening in a wall thereof;
a rod received within said opening and having one end tiltably coupled to said housing and its other end projecting from said housing;
a conductive hollow shaft slidably accommodating said rod therein and having one end inside said housing and another end projecting further from said housing than the other end of said rod, said hollow shaft being movable from a rest position to a second position in which its one end is advanced further into said housing;
first resilient means coupled between said housing and said

hollow shaft for urging said hollow shaft to its rest position;

means for retaining said hollow shaft in its rest position;

second resilient means provided in said opening between said housing and said hollow shaft to oppose lateral movement of the hollow shaft;

a conductive contact element engaging the other end of said hollow shaft; and

position detection circuit means coupled to said contact element for generating a signal when said element contacts a workpiece.

4,621,437

METHOD AND APPARATUS FOR DRYING A SOLID MATERIAL WETTED WITH A SOLVENT OR SOLVENT MIXTURE

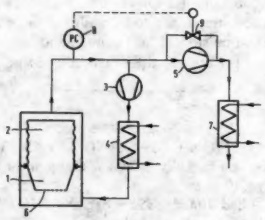
Robert Grande; Cornelis J. de Kluizenaar, both of Weesp, Netherlands; Dietmar C. Naunapper, and Karlheinz J. Wehrle, both of Binzen bei Lörrach, Fed. Rep. of Germany, assignors to Duphar International Research B.V., Netherlands and Glatt GmbH, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 680,835

Claims priority, application Netherlands, Dec. 19, 1983, 8304347; May 8, 1984, 8401463

Int. Cl.[4] F26B *3/12*

U.S. Cl. 34—10 **21 Claims**



1. A method of drying a solid material wetted with a solvent or solvent mixture, wherein said material is in particulate form, comprising providing said wetted material in an evaporation chamber, providing a subatmospheric pressure in said evaporation chamber and adjusting said subatmospheric pressure to control the temperature in said evaporation chamber, flowing a superheated vapor of said solvent or solvent mixture as a carrier medium through said material in said evaporation chamber to evaporate said solvent or solvent mixture and carry said evaporated solvent or solvent mixture along with said carrier medium, and condensing said evaporated solvent or solvent mixture from said carrier medium in a cooling apparatus, wherein said step of flowing said vapor through said material fluidizes said material.

4,621,438

ENERGY EFFICIENT CLOTHES DRYER

Francis Lanciaux, Fort Wayne, Ind., assignor to Donald M. Thompson, Glen Ellyn, Ill., a part interest

Continuation-in-part of Ser. No. 212,804, Dec. 4, 1980, abandoned. This application Jan. 13, 1983, Ser. No. 457,528

Int. Cl.[4] F26B *21/06*

U.S. Cl. 34—77 **20 Claims**

1. A heat pump dryer appliance for clothes and other washable products comprising, in combination:

(a) a cabinet having a drum compartment with opposed front and rear walls and an auxiliary compartment having a front wall in common with said rear wall of said drum compartment;

(b) a power driven rotatable tumbling drum housed in said drum compartment and having front and rear ends;

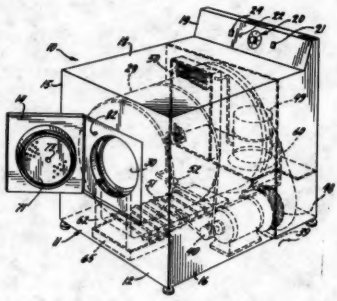
(c) combined bearing and air seal means for rotatably supporting said drum on a fixed rotational axis within said drum compartment;

(d) said bearing and air seal means including a first pair of annular members fixed respectively to said front and rear walls of said drum compartment, and a second pair of annular members disposed in sliding engagement with said first pair and fixed to respective ends of said drum;

(e) said annular members being formed from rigid non-metallic plastic material;

(f) each said annular member of one said pair defining a track and each said annular member of the other said pair defining a slider interfitting with said track;

(g) a resilient sealing gasket interposed between each said slider and said track;



(h) each said annular slider having a wedge shaped bead overlying its associated track inside said drum and tapering axially in thickness toward the rotational axis of said drum;

(i) a heat pump system in said cabinet including a compressor, condenser, expansion valve and evaporator defining a closed refrigerant circuit;

(j) means for circulating a stream of heated drying air in a substantially closed path through said condenser, said tumbling drum, said evaporator, said rear wall of said drum compartment, and across said compressor; and

(k) said evaporator being formed as an air duct underlying said tumbling drum and defining a section of said substantially closed path running through said drum compartment.

4,621,439

APPARATUS FOR SPEEDY DRYING

Chen Maw-Chyi, No. 68, Chiu She Rd., She Village, Hou Li Hsiang, Taichung, Hsien, Taiwan

Filed Aug. 7, 1985, Ser. No. 763,412

Int. Cl.[4] F26B *9/06*

U.S. Cl. 34—92 **1 Claim**

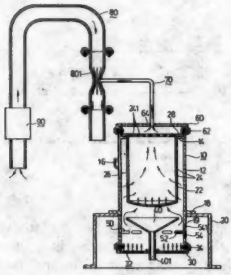
1. A dryer, comprising:

a closed container having a compartment for receiving an object to be dried and an outlet vapour port on a top side thereof, wherein said compartment is formed by a porous container which is provided in an upper portion of said closed container, said porous container having at least one top opening for venting humid vapour to said outlet vapour port and a plurality of first perforations on its body and bottom side, and said closed container further including a plurality of second perforations on the bottom side of said container and a funnel below said porous container for receiving liquid coming out from said first perforations;

electric heating means for providing heat to said compartment disposed in a lower portion of said closed container, including a plurality of looped electric heating tubes

mounted on said closed container at intervals and electrically interconnected in parallel;

means for controlling the number of said looped electric heating tubes being used at one time in order to regulate a temperature within said closed container according to the objects to be dried; and



means for drawing humid vapour from said compartment, said drawings means including a first conduit, a venturi section, a second conduit connected to the middle portion of said venturi section and said outlet vapour port, and incorporating a blower for blowing air into said first conduit.

4,621,440

CONVECTION DRYER AND/OR FIXING MACHINE

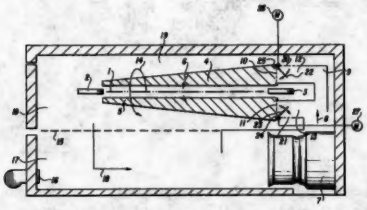
Franz-Josef Gierse, Siegen; Heinrich Hermanns, Korschenbroich; Werner Hermes, Tönisvorst; Gerhard Lüpnitz, Mönchen-Gladbach; Manfred Pabst, Cologne; Heribert Schlicht, Mönchen-Gladbach, and Franz-Josef Schroer, Erkelenz, all of Fed. Rep. of Germany, assignors to A. Monforts GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 658,546

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 3336331

Int. Cl.[4] F26B *13/02*

U.S. Cl. 34—155 **5 Claims**



1. Convection drying and/or fixing machine for the thermal treatment of a textile fabric web with a treatment gas, comprising nozzle boxes above and below the fabric web extended across the width of the fabric web, said nozzle boxes having inlet openings with a given size and shape for receiving the treatment gas and outlet openings for directing the treatment gas onto the fabric web, a pressure chamber directly adjacent said inlet openings for directing the treatment gas into said inlet openings of said nozzle boxes, said pressure chamber having bypass openings with substantially said given size and shape, each of said bypass openings being adjacent a respective one of said inlet openings forming a respective pair of openings, a return flow chamber receiving the treatment gas directly from said bypass opening and circulating the treatment gas to said pressure chamber, common bypass flaps each being disposed at a respective one of said pair of openings, and means for moving each of said bypass flaps between a first position closing a respective one of said bypass openings and a second position closing a respective one of said inlet openings and bypassing the fabric web.

4,621,441

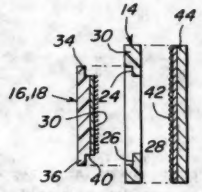
PERSONALIZED SHOE EMBLEM SIGNATURE

Keith R. Wagner, 490 Jefferson Ave., Brooklyn, N.Y. 11221, and Richard L. Miller, Dix Hills, N.Y., assignors to Keith R. Wagner, Brooklyn, N.Y.

Filed Jan. 23, 1985, Ser. No. 694,132

Int. Cl.[4] A44C *3/00*

U.S. Cl. 40—2 E **1 Claim**



1. A personalized shoe emblem signature comprising:

(a) a frame having a hollow central portion, a uniformly flat rear portion, and including two lips disposed in said hollow central portion;

(b) at least one emblem removably disposed on said hollow central portion of said frame and including a projection disposed on its top and bottom sides for seating onto said two lips, and a rear side covered with VELCRO ®, said rear portion of said frame being free of any VELCRO ®; and

(c) means for simultaneously removably mounting said frame and said at least one emblem to each other and to said shoe so that said frame is interchangeable from said emblem and from said shoe, and said at least one emblem is interchangeable from said frame and from said shoe, and thus permitting a personal choice of said frame and said at least one emblem by a user, wherein said mounting means include said at least one emblem being placed in said hollow central portion of said frame so that said projections seat on said lips of said frame, and said VELCRO ® of said at least one emblem matching with a VELCRO ® affixed on said shoe so that said frame is removably sandwiched and retained only by means of said at least one emblem, and said personalized shoe emblem signature is formed and attached to said shoe.

4,621,442

SIMPLIFIED MULTILAYER LABEL

Jory B. Mack, Chicago, Ill., assignor to Pamco Label Co., Rosemont, Ill.

Filed May 24, 1985, Ser. No. 737,528

Int. Cl.[4] G09F *3/02, 3/10*

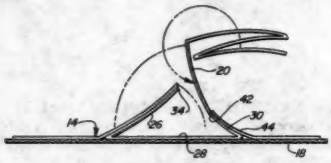
U.S. Cl. 40—2 R **7 Claims**

1. A multilayer label which comprises:

a front sheet having an adhesive-coated side, a multilayer folded leaflet member adhering to a portion of said adhesive-coated side spaced from the ends of such front sheet;

a first transverse line of tearing weakness defined on said front sheet over said folded leaflet member, said folded leaflet defining a short-folded front layer adhering to said

adhesive-coated side, whereby an edge of said front layer lies spaced from parallel edges of said folded leaflet and



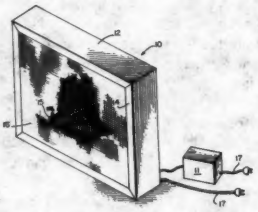
some of said adhesive-coated side adheres to the folded layer of the leaflet member adjacent to said front layer.

4,621,443

DIGITAL SCREEN DISPLAY APPARATUS

Stephen Weinreich, 14 Norton Rd., Monmouth Junction, N.J. 08852

Filed Jul. 13, 1984, Ser. No. 630,832
Int. Cl.[4] G09F *19/00*
U.S. Cl. 40—436 **30 Claims**



1. A digital screen display apparatus for illumination by a light source comprising:

a front diffuser means;

a back diffuser means for illumination by said light source and separated from said front diffuser means by a predetermined gap;

grid means located between said back and front diffuser means;

mask means for blocking out light from said light source at regular intervals, said mask means being located between said light source and said back diffuser means;

storage means for storing visual information, said storage means locatable between said light source and said mask means, said storage means comprising a partially transparent film means having optical information thereon, said partially transparent film means comprising a plurality of slides each having visual information thereon;

upper and lower tab means attached to said slides; and,

drive means for moving said slides with respect to said back diffuser means, said drive means comprising ribbon means for connection to said tab means, lever means connected to said ribbon means, and a solenoid connected to said lever means,

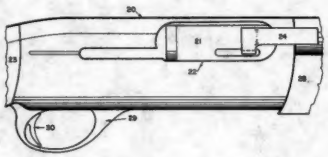
wherein actuation of said solenoid moves said lever means and said ribbon means thereby causing said slide means to translate with respect to said back diffuser means.

4,621,444

SHELL DEFLECTOR ATTACHED TO THE RECIPROCABLE BOLT OF A FIREARM

Darryl P. Anderson, 7630 St. Clair Ave., North Hollywood, Calif. 91605

Filed Mar. 22, 1984, Ser. No. 592,264
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—98 **6 Claims**



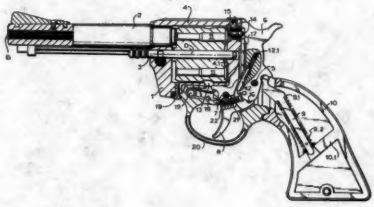
1. In combination; a firearm having a laterally opening ejection port through which a spent shell is ejected, a reciprocable bolt having a shell ejector mechanism operable upon rearward movement of said bolt, and a bolt handle opening for receiving an outwardly extending bolt handle for manually operating the reciprocable bolt and shell ejector mechanism; and a deflector device mounted on said bolt in said bolt handle opening in place of said bolt handle wherein said deflector device moves with said bolt and has a portion extending forwardly of said bolt adjacent said ejection port such that an ejected shell upon exiting said firearm strikes said deflector device and is deflected in a forward direction.

4,621,445

WEAPON WITH LOCKING TRIGGER

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,902
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1984, 3402006
Int. Cl.[4] F41C *17/04*
U.S. Cl. 42—66 **17 Claims**



14. In a safety device for a weapon with a weapon frame (**1**) forming parallel axis (**5** and **7**) for pivotally journaling a trigger (**8**) and hammer (**6**) which actuates a striker pin (**14**) the hammer (**6**) being adjustable and movable against the force of a hammer spring (**9.1**) from its rest first position into a tensioned cocked or second position to thereby move a trigger (**8**) against the force of a trigger spring (**18**) from the rest position into a ready-to-fire or second position in which the trigger (**8**) arrests the hammer (**6**) in the tensioned position, wherein a trigger bar is kinematically linked to the trigger and by actuation of the trigger an upper free end of the trigger bar is positioned between the striker pin and the hammer when the trigger has assumed the ready-to-fire position, so that the rebounding hammer moves the striker pin by way of the free end of the trigger bar in an axial direction the safety device including a lock part which is operative between the trigger and the hammer, which lock part can assume a locking or first position when the trigger and the hammer are in their respective rest positions, for precluding movement of the trigger the lock part

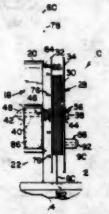
furthermore during movement of the hammer from the rest position into the cocked position releases the trigger so that it can be moved or swung into the ready-to-fire position, whereby the lock part leaves its locking or first position; and that finally, when the hammer has returned to its first or rest position, the lock part also returns to its locking or first position during swinging back of the trigger from the ready-to-fire position into its rest or first position, so that the trigger is locked, the improvement wherein: the lock part (21) is movably guided in the trigger (8) said lock part (21) having a projecting surface which is urged by a lock spring (22) against the hammer, and within a run-off first surface (24) defined by the hammer (6) engageable with the projecting surface (27), a catch recess (25) is provided and has a leading edge capable of acting as a catch hook (26) during swinging of the hammer into a tensioned position, whereby an outer side of the catch hook (26) forms a portion of the run-off first surface (24) and an edge of the catch recess (25), which edge merges with the run-off first surface (24), and forms a cam projection (40) which can move the lock part (21) out of its locking position; and wherein the lock part (21), when both the trigger (8) and the hammer (6) are in rest position, enters into the catch recess (25) whereby a lock part (21) frontal face side has a laterally projecting projection (27) and whereby a clear distance between the free end of the catch hook (26) and a juxtaposed edge of the catch recess (25) is smaller than the same direction measured width of a run-off second surface (23) defined by the lock part (21), so that the run-off first surface of the hammer (6) rebounding from its tensioned position runs off slidingly over the run-off second surface (23) at the lock part (21) and an outer side of the catch hook thereby holds the lock part (21) without locking action at the hammer (6).

4,621,446

FISHING RIG

Malon Anderson, P.O. Box 460, Hot Springs, S. Dak. 57747

Filed Jan. 6, 1986, Ser. No. 816,293
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 **7 Claims**



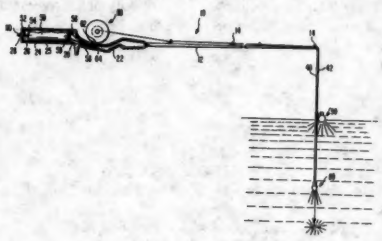
1. An ice fishing rig comprising:
a flat base member sized to cover a hole of predetermined size formed through an ice layer;
a frame member secured to said base member;
a reel having a central spool disposed between opposing end plates;
means for mounting said reel with said spool having an axis rotatable about a horizontal axis;
a hole formed through said base member and aligned with a radial edge of said spool;
signal means disposed on a pivot rod;
means for pivotally supporting said pivot rod at a pivot point on said base member with said rod extending from said point in one direction to said signal means and extending from said point to a free end of said rod in an opposing direction;
biasing means for urging said rod to pivot toward a signalling position; and
means for releasably securing said rod in a second position comprising hook means carried on said reel and a hook engaging pin secured to said rod and extending therefrom and captured within said hook means when said rod is pivoted to said second position.

4,621,447

FISHING APPARATUS WITH ILLUMINATED BAIT

James A. Rhodes, 42 E. Gay St., Ste. 1300, Columbus, Ohio 43215

Filed Apr. 5, 1985, Ser. No. 720,322
Int. Cl.[4] A01K *85/01*
U.S. Cl. 43—17.5 **3 Claims**



1. A fishing apparatus comprising:
a fishing rod with a handle adapted to hold a battery therein;
a fishing reel attached to said rod;
a pair of insulated electrically conducting wires carried by said reel and connected with said handle to conduct electrical power from a battery therein, for serving as fishing line;
fluorescent bait means connected to said wires near the end thereof remote from said reel opposite said handle;
ultraviolet bait illuminating means connected to said wires adjacent said fluorescent bait means to receive electrical power from the battery within said handle for illuminating said bait means to attract fish thereto.

4,621,448

FISHING APPARATUS

Matthew A. Pennise, Rte. 8, Box 786T, Pensacola, Fla. 32506

Filed Mar. 4, 1985, Ser. No. 707,896
Int. Cl.[4] A01K *79/00*
U.S. Cl. 43—42.72 **8 Claims**

1. A fishing apparatus comprising:
a. an upper frame;
b. a lower base frame;

c. means for allowing said upper frame to slidably move between open and closed positions in relation to said lower frame;

d. means interconnecting said upper and lower frame for allowing said apparatus to expand outwardly upon the lowering of said upper frame to the lowered position thereof; and

e. a plurality of fishing lines positioned on said apparatus so that upon said apparatus being positioned in said expanded open position, said fishing lines define an extended radial area for fishing, wherein said plurality of fishing lines further provide means for allowing outward movement of said lines for moving said lines into said open expanded position.

4,621,449

FISHING HOOK

Katsutoshi Nakagawa, 517-18, Komoe, Nishiwaki-shi, Hyogo, Japan

Filed Sep. 20, 1984, Ser. No. 652,755
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—44.83 **4 Claims**

1. A fishing hook to which a fishing line is to be attached comprising:

a stem having an upper and lower end,

a curved hook at the lower end of said stem,

a line stopper having a greater diameter then said stem at the upper end of said stem,

a continuous groove formed axially along the upper part of the stem and inwardly from the outer edge of said stopper of a depth sufficient to accommodate the fishing line so that a line wound around the stem in the area of said groove will fully contact the stem and encase the line in said groove.

4,621,450

HEAT SHRINKABLE TUBE OF POLYVINYL CHLORIDE FOR PROTECTING STEM OF CUT FLOWERS

Kiyokazu Hirobe, Nagahama, and Naokuni Tsujii, Shiga, both of Japan, assignors to Mitsubishi Plastics Industries Limited, Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 713,802
Claims priority, application Japan, Jun. 7, 1984, 59-117370
Int. Cl.[4] A01C *1/00*; B29C *41/00*
U.S. Cl. 47—58 **4 Claims**

1. A method for protecting the stem of a cut flower, comprising:

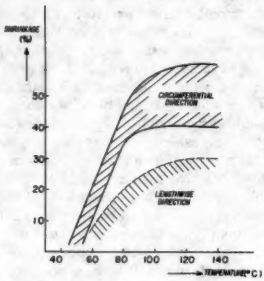
(i) inserting the stem of the said cut flower into a heat shrinkable tube of polyvinyl chloride having the following properties:

(a) a shrinkage at 60° C. of 8% or less in the lengthwise direction, and from 10% to 20% in the circumferential direction;

(b) a shrinkage at 80° C. of 20% or less in the lengthwise direction, and from 35% to 45% in the circumferential direction;

(c) a shrinkage-initiating temperature in the circumferential direction of from 40° C. to 55° C.;

(d) a softening temperature of from 40° C. to 55° C.; and



(e) a thickness of from 50 μm to 100 μm; and

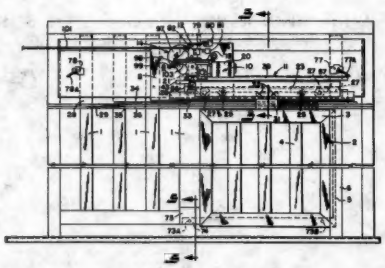
(ii) heat shrinking said tube.

4,621,451

ACTUATING AND LOCKING MECHANISM FOR SLIDING DOOR

Arthur Bruehler, 1732 Center Rd., Avon, Ohio 44011

Filed Oct. 15, 1985, Ser. No. 787,081
Int. Cl.[4] E05B *47/00*
U.S. Cl. 49—15 **29 Claims**



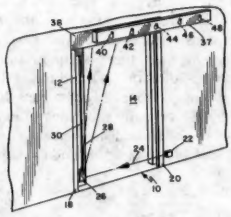
1. An actuation and locking mechanism for a slidable prison door or the like comprising a mounting plate removably secured in an enclosed transom over the door, a pivotal motor assembly removably mounted on said mounting plate and including a selectively driven pinion, a selectively movable carriage assembly in the transom having a rack thereon normally in mesh with the pinion and having the door suspended therefrom, a drop bar assembly including a drop bar mounted on and selectively vertically driven relative to the mounting plate, the drop bar having lock means thereon which lock the carriage assembly in the locked position of the drop bar to preclude carriage assembly and door movement and which unlock the carriage assembly in an unlocked position of the drop bar to allow the carriage assembly and door to be slidably driven by the rack and pinion upon motor actuation, and an emergency release assembly pivotally mounted on the mounting plate normally to hold the pivotal motor assembly in place with the pinion in mesh with the rack, said emergency release assembly upon actuation pivoting the pivotal motor assembly to disengage the pinion from the rack and moving the drop bar to the unlocked position wherein the lock means unlocks the carriage assembly to allow the door to be manually opened or closed.

4,621,452

POWERED SLIDING DOOR SAFETY SYSTEM

Wyman L. Deeg, 2604 Raynell Dr., San Diego, Calif. 92123

Filed Jan. 18, 1985, Ser. No. 692,535
Int. Cl.[4] E05F *15/20*
U.S. Cl. 49—28 5 Claims



1. A safety system for powered sliding doors which close a door opening by using door moving means for slideably moving a leading edge of a door across the door opening to a closed position comprising:

transmitter means mounted adjacent the door opening in a stationary manner for projecting a beam of energy in a predetermined illuminating pattern from a side of said door opening adjacent said closed position across the door opening toward the leading edge in a direction approximately parallel to the direction of movement of said door;

reflecting means mounted on the door adjacent said leading edge for reflecting the energy beam projected by the transmitter means toward an edge of the door opening, along a direction transverse to the direction of movement for said door; and

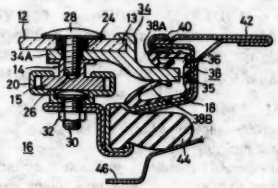
energy detecting means secured in a stationary manner adjacent said door opening so as to receive said redirected beam of energy, while the door is closing.

4,621,453

CONSTRUCTION OF DOOR IN MOTOR VEHICLE

Hiroyuki Watanabe; Eiichi Hamada, both of Toyota; Motomu Hayashi, Okazaki, and Kenji Ono, Toyota, all of Japan, assignors to Toyota Jidoshi Kabushiki Kaisha, Aichi, Japan

Filed Jul. 27, 1984, Ser. No. 635,246
Claims priority, application Japan, Jul. 29, 1983, 58-119491[U]
Int. Cl.[4] E05F *11/38*
U.S. Cl. 49—374 8 Claims



1. A vehicle door comprising:

a door section having a door panel and a window frame, said door panel having an inner housing extending between an exterior and an interior of said vehicle when said door section is closed, said inner housing including an opening along an upper surface of said door panel, said window frame being secured to said door section at opposite ends of said opening and defining a window section;

a door glass slidably mounted within said window section and said inner housing, said door glass having an arcuate configuration when viewed in cross section in the direction of the length of the vehicle and defining a projected normal arc of curvature corresponding to said arcuate configuration of said door glass extending downward from said door glass when said door glass is in a closed position covering said window section, wherein at least a substantial portion of said door glass is housed within said inner housing when said door glass is slidably positioned to an open position; and

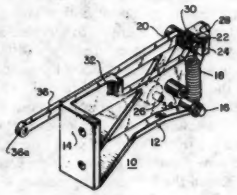
channel means for guiding said door glass between said open and said closed positions, said channel means having an actual arc of curvature when viewed in cross section in the direction of the length of the vehicle, said actual arc of curvature being displaced radially inward from said projected normal arc of curvature within said inner housing, so that said door glass is proximate said interior of said vehicle in said open position, while being substantially flush with said, exterior of said door panel when in said closed position.

4,621,454

MECHANISM FOR CONTROLLABLY OPENING AND CLOSING APPLIANCE DOOR OR PANEL

Richard J. Halstead, Chesapeake, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Mar. 4, 1985, Ser. No. 708,147
Int. Cl.[4] E05F *1/10*
U.S. Cl. 49—386 6 Claims



1. Mechanism for controllably opening and closing an appliance door or panel comprising:

(a) a door or panel pivoted about a substantially horizontal axis for movement between first and second pivoted positions, said door exhibiting a non-linear weight component force acting normally on said door to thereby produce a non-linear torque on said door as said door moves between said positions;

(b) biassing means for applying biassing forces in reaction to physical deformations thereto; and

(c) mechanical coupling means connected to said door and to said biasing means for deforming said biasing means with movements of said door and for creating biassing forces and coupling said biassing forces to said door which at least approximate the non-linear weight component force acting normally on said door, whereby the non-linearity of said torque acting on said door is at least partially compensated or neutralized, thereby allowing said door to be moved between said first and second positions by application of a substantially uniform external force on said door, said mechanical coupling means comprising a pivotally mounted crank connected to said biassing means and a link connecting said crank and said door.

4,621,455

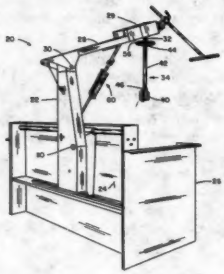
COMBINATION HORIZONTAL/VERTICAL HONING MACHINE

Robert M. Sunnen, Frontenac; Wayne W. Althen, St. Louis County, and Rickey S. Riehl, Brentwood, all of Mo., assignors to Sunnen Products Company, St. Louis, Mo.

Filed Sep. 12, 1985, Ser. No. 775,229

Int. Cl.[4] B24B *33/08*

U.S. Cl. 51—34 R **30 Claims**



1. A honing machine comprising

a housing having spaced opposed front and rear walls and spaced side walls connected therebetween,

a horizontally extending rail positioned adjacent to the rear wall,

an elongated support structure and means for mounting the support structure for horizontal movement on the rails, said support structure including pivot support means to enable the support structure to be moved between a first operative position extending in substantially a vertical orientation to a free upper end thereof and a second operative position extending substantially horizontally relative to the rear wall,

an elongated arm assembly having a first end connected to the support structure adjacent to the free end thereof and a second end positioned extending forwardly therefrom so that the arm assembly extends above the space defined by and between the front, rear, and side walls of the housing in the vertical position of the support structure, the second end of the arm assembly being movable substantially vertically relative to the support structure in the vertical position, said arm assembly extending forwardly parallel to the side walls in the horizontal position of the support structure,

means adjacent to the second end of the arm assembly for coupling the arm assembly to a honing mandrel assembly, and

means to enable the support structure, the arm assembly and a honing mandrel assembly operatively connected thereto to move linearly in concert in a horizontal direction being guided in said movement by the rail when the support structure is in its second operative position.

4,621,456

GRINDING MACHINE FOR MOWING MACHINE CYLINDER BLADES

Ralph Winstanley, Wetmoor Lane, Wath-upon-Dearne, Rotherham S63 7LR, England

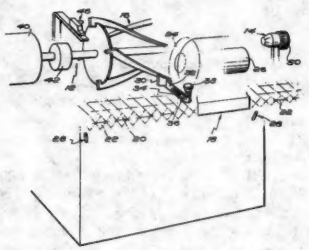
Filed May 17, 1985, Ser. No. 735,203

Claims priority, application United Kingdom, Mar. 5, 1985, 8505655

Int. Cl.[4] B24B *3/42*

U.S. Cl. 51—48 HE **8 Claims**

1. A grinding machine for grinding mowing machine cylinder blades and capable of grinding blade cylinders with different numbers of blades without the need for special adaptation between grinding operations on different blade cylinders, the grinding machine including means for mounting a blade cylinder for rotation about its longitudinal axis; a grinding wheel head mounted on guides for traversing movements longitudinally of the blade cylinder; means for traversing the grinding wheel head to and fro on its guides; a finger guide adjustably positioned beneath the grinding wheel as a support for each blade of the blade cylinder in turn as grinding takes place so that as a traverse movement of the grinding wheel takes place the abutment of the finger guide against the particular blade concerned and the abrasive action of the grinding wheel against the blade causes the blade cylinder to rotate in timed relation to the traverse movement of the grinding wheel head and in the appropriate direction according to the direction of traverse of the grinding wheel head; means for driving the blade cylinder when it is required to index the cylinder around from one blade to the next, said means being constituted by a motor unit and a variably engageable and disengageable clutch



device such that drive is only transmitted from the motor unit to the blade cylinder while the clutch device is engaged by an appropriate signal; and means for triggering into operation the signal required to initiate an indexing rotation of the blade cylinder and for variably disengaging the clutch device when an appropriate predetermined but variable indexing movement has taken place, said means including a pair of detector devices, that is to say a first detector device acting to detect the arrival of the grinding wheel head at one end of its traverse with the grinding wheel and finger guide clear of the blade cylinder and thus triggering into operation the signal required, and a second detector device acting to detect the variable arrival of the next following blade at a position previously occupied by another blade and thus to cause the disengagement of the clutch device, so that the operation of the machine is independent of the number of blades of the blade cylinder.

4,621,457

INDEXED LAPPING MACHINE

Jesse R. Moyer, Kersey, Pa., assignor to Exotic Metals, Inc., Ridgway, Pa.

Filed Nov. 8, 1984, Ser. No. 669,811

Int. Cl.[4] B24B *33/08*

U.S. Cl. 51—59 R **13 Claims**

1. A lapping machine characterized by:

a housing defining a cylinder;

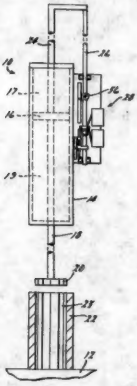
a piston operably mounted within said cylinder;

a rod fixed to said piston forming a piston and rod assembly and constructed to be connectable to a lapping tool;

actuating means for thrusting said piston toward an object to be lapped by said lapping tool with a predetermined force and a predetermined time until friction overcomes said thrusting when said piston is in a thrusted position; and

retracting means for retracting said piston a predetermined distance from its thrusted position, said retracting means including a stroke length camming member movably connected onto said piston and rod assembly for indexing said thrusting and retracting of said piston to variably limit the predetermined distance said piston is retracted from its thrusted position with each thrust of said piston and rod

assembly, a stationary abutment shoulder adapted to abut said stroke length camming member and retain it in place



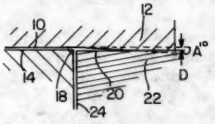
after said piston is thrusted toward said object a set distance, and a switch means for ceasing further retraction of said piston and rod assembly.

4,621,458

FLAT DISK POLISHING APPARATUS

Robert S. Smith, 1263 Emory St., San Jose, Calif. 95126

Filed Oct. 8, 1985, Ser. No. 785,489
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—111 R **3 Claims**



1. An apparatus for polishing the first and second flat sides of a disk having a thickness, each side being bounded by an edge, which comprises:

a plurality of rollers free to rotate about their axes oriented perpendicular to said disk surfaces and whose curved side of each roller has a groove where contact is made to said edge of said disk so that said disk is supported but is free to rotate about its center

a first pad and a second pad, each having a center and each having a first side covered with polishing medium and a second side;

a first shaft and a second shaft attached respectively perpendicularly to the second side at the center of said first and second pads so that each said pad may rotate about its center and slide in an axial direction so that said first side of each said first and second pads can be maintained in contact with said first and second side respectively of said disk thereby causing said disk to rotate in order to polish said entire first and second sides of said disk;

a flat buffer plate having a thickness that is slightly less than said thickness by a small increment of said disk and a boundary that is contoured so that said boundary may be positioned adjacent to said edge;

a plurality of sleeves perpendicularly attached to said buffer plate and each sleeve slides on a pin so that the location of said buffer plate is determined in the direction perpendicular to said buffer plate by contact with said polishing medium;

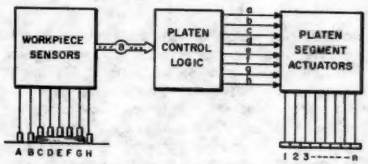
so that by selecting said small increment to be no larger than a value that limits droop of the polishing medium over the edges, the average pressure by the polishing medium over the surface of the disk is sufficient to polish the surface of the disk but the greatest pressure which occurs at the edge will not cause rounding of the disk edge or uneven wear of said polishing medium.

4,621,459

SEGMENTED PLATEN WITH DIAPHRAGM CYLINDER CONTROL

Lee E. Stump, Brooklyn Park; Eugene C. David, Minneapolis, and Dale Boehne, Cologne, all of Minn., assignors to Timesavers, Inc., Minneapolis, Minn.

Continuation of Ser. No. 602,920, Apr. 23, 1984, Pat. No. 4,527,359. This application Jun. 28, 1985, Ser. No. 749,867
The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.
Int. Cl.[4] B24B *21/08*
U.S. Cl. 51—138 **3 Claims**



1. In combination with a sanding and polishing machine for individual workpieces and having a frame, infeed conveyor means arranged thereon for conveying workpieces along a predetermined path, endless abrasive belt means coupled to the frame and defining a working station disposed along said path and including an endless abrasive belt, means driving said belt, belt guide means, and segmented platen means for adjustably positioning said belt guide means relative to said predetermined path; drive means for each individual segmented platen, said platen drive means comprising:

(a) adjustable positioning means comprising a plurality of vertically movable diaphragm actuated plungers for adjustably positioning individual segments of said segmented platen means to define the composite configuration of said segmented platen means;

(b) control means for controllably actuating selected ones of said plurality of vertically movable diaphragm actuated plungers;

(c) sensing means normally disposed above said conveyor means for sensing the width, in a direction transverse to the feed path of individual workpieces moving along said conveyor means and for creating a product presence signal responsive to the sensed condition of a workpiece being present therebeneath;

(d) signal processing means having a first input responsive to the signal created by said sensing means to actuate said control means so as to actuate a selected number of said plurality of diaphragm actuated plungers corresponding to the sensed width of the individual workpieces; and

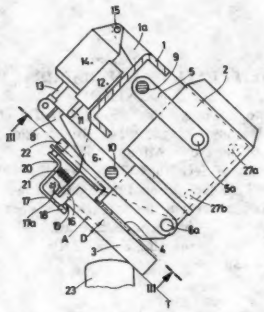
(e) said signal processing means further having a second input, said second input associated with said signal processing means to create an output signal in addition to said product presence signal for selectively actuating vertically movable diaphragm actuated plungers in addition to those acutated by said product presence signal.

4,621,460

MACHINE FOR RESHAPING RAIL HEADS

Frédy Scheuchzer, Lausanne, and Fritz Buehler, Ecublens, both of Switzerland, assignors to Les Fils d'Auguste Scheuchzer S.A., Lausanne, Switzerland

Filed May 15, 1984, Ser. No. 610,383
Claims priority, application European Pat. Off., May 17, 1983, 83200699.3
Int. Cl.[4] E01B *31/17*
U.S. Cl. 51—178 10 Claims



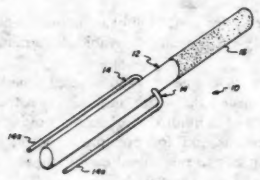
1. A machine for reshaping rail heads which comprises a support structure, at least one grinding unit mounted on said support structure, said grinding unit comprising a grinding wheel, having an operative face for engagement with a rail head to form thereon at least one ground face according to a theoretical tangent along at least one generatrix of the theoretical cross section of the rail head, means for driving said grinding wheel, means for positioning said grinding wheel with respect to the rail head including means for moving said grinding wheel toward and away from the rail head, means coacting with the operative face of said grinding wheel for sensing the position of the operative face of said grinding wheel and means responsive to said sensing means for controlling said positioning means to position the operative face of said grinding wheel in the plane of said theoretical tangent of said rail head.

4,621,461

BOWLING BALL FINGER HOLE SIZING TOOL

James F. Martin, 3684 Mill St., Marion, N.Y. 14505

Filed Nov. 20, 1984, Ser. No. 673,491
Int. Cl.[4] B24B *25/00*
U.S. Cl. 51—181 R 3 Claims



1. A tool for facilitating the placement of tape shims in the finger holes of bowling balls, said apparatus comprising:

an elongated member; and

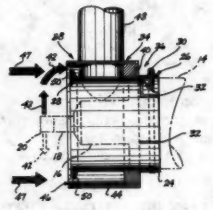
a pair of arms connected to said elongated member in a fixed relation said arms respectively having a portion parallel to and spaced from said elongated member the dimension between said arm portions being less than the diameter of a bowling ball finger hole, said elongated member and arms being cooperable with a tape shim threaded over said elongated member and under said arms to retain such shim on said elongated member whereby said member with a threaded tape shim may be inserted into a bowling ball finger hole, pressed against the wall of such finger hole at a desired location to transfer such tape shim to such finger hole to shim such finger hole, and thereafter removed leaving such tape shim properly secured to such finger hole at such desired location. and wherein said elongated member includes an abrasive surface portion spaced from said pair of arms, said abrasive surface being adapted to be selectively utilized to enlarge said finger hole.

4,621,462

DUST COLLECTION APPARATUS

Robert L. Hinshaw, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 6, 1985, Ser. No. 773,305
Int. Cl.[4] B24B *55/06*
U.S. Cl. 51—273 12 Claims



1. A dust collection apparatus for a machine tool that includes a body, a rotatable spindle mounted at one end to the body and projecting therefrom, and a cutter attached to the other end of the spindle, said dust collection apparatus comprising:

(a) a hollow sleeve having an inner end and an outer end, the inner end of the sleeve sized to fit over and be attached to the body of the machine tool so that the cutter projects outwardly through the outer end of the sleeve;

(b) a hollow shroud connected to the sleeve and having a cross-sectional area greater than the sleeve, the shroud being positioned to substantially surround the sleeve, the shroud having an inner end and an outer end corresponding to the inner end and the outer end, respectively, of the sleeve, the shroud being configured and arranged to define a chamber between the sleeve and shroud, the chamber extending substantially around the periphery of the sleeve, the chamber having an open inlet end defined by the space between the outer end of the sleeve and the outer end of the shroud;

(c) an outwardly projecting flange attached to the outer end of the shroud;

(d) suction means connected to the shroud for creating a vacuum in the chamber defined between said sleeve and the shroud; and

(e) restriction means operatively associated with the inlet end of the chamber for minimizing the cross-sectional area of the chamber at the inlet end.

4,621,463

METHOD OF GRINDING CAMS ON A CAMSHAFT

Yuichiro Komatsu, and Toshio Maruyama, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

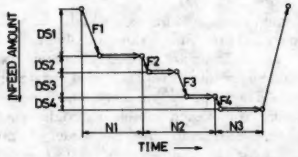
Filed Oct. 17, 1984, Ser. No. 661,684
Claims priority, application Japan, Oct. 20, 1983, 58-196626
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—281 C 9 Claims

1. A method of successively grinding a plurality of cams of

a camshaft by axially indexing said camshaft for selectively aligning said cams with a grinding wheel and by subsequently bringing an aligned one of said cams into contact with said grinding wheel while said camshaft is rotated and rocked respectively about its axis and a pivot axis parallel thereto, said method comprising:

a first step of removing the substantial part of a removal amount of said aligned one of said cams by effecting a rough grinding in such a manner that said grinding wheel is infed while said camshaft is rotated at a first slow rotational speed;

after a spark out period, subsequently and without dressing said grinding wheel, performing a second step of removing a part of said removal amount which is to be cut off but left uncut in said first step, from side portions of said aligned one of said cams by rotating said camshaft at a second high rotational speed as compared to said first rotational speed;



after a spark out period, subsequently and without dressing said grinding wheel, performing a third step of removing a thermally affected layer from said aligned one of said cams by infeeding said grinding wheel while said camshaft is rotated at a third high rotational speed as compared to said first rotational speed;

after a spark out period, subsequently and without dressing said grinding wheel, performing a fourth step of effecting a finish grinding by infeeding said grinding wheel while said camshaft is rotated at a fourth slow rotational speed as compared to said second rotational speed; and

after a spark out period, a first step of axially indexing said camshaft for bringing another cam of said camshaft into alignment with said grinding wheel so as to subsequently grind said another cam by sequentially performing said first to fourth steps.

4,621,464

EDGING GLASS SHEETS WITH DIAMOND WHEELS

Joseph B. Kelly, Crestline, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 30, 1984, Ser. No. 605,507

Int. Cl.[4] B24B *1/00*

U.S. Cl. 51—283 E **3 Claims**

1. An edge grinding wheel for shaping an edge of a glass sheet, comprising:

a plurality of blocky diamonds having XYZ coordinates in an approximate ratio of 1 to 1 to 1; and

an adhesive to secure said blocky diamonds at the surface of said ginding wheel to provide a grinding surface with a blocky diamond concentration not to exceed approximately 15 carats per cubic inch.

4,621,465

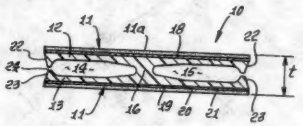
FLEXIBLE FILE HAVING FLEXIBLE ABRASIVE SHEETS MOUNTED ON FLEXIBLE FLANGES

William E. Pangburn, 2707 Bay Shore, Ventura, Calif. 93003

Continuation-in-part of Ser. No. 563,151, Dec. 12, 1983, Pat. No. 4,534,138. This application May 16, 1985, Ser. No. 734,885

Int. Cl.[4] B24D *15/04*

U.S. Cl. 51—392 **7 Claims**



1. In a nail file, the combination comprising

(a) an elongated holder having an elongated handle, consisting of synthetic resin, said holder having relatively thin upper and lower elongated flanges, and an elongated medial web interconnecting the flanges adapting the flanges to flex relative to the web,

(b) a resiliently flexible first sheet having an abrasive surface,

(c) the sheet retained to one of the flanges so that said abrasive surface is outwardly presented whereby the sheet when pressed against a fingernail flexes along with said one flange and assumes the contour of the fingernail, the sheet being elongated in the direction of the handle,

(d) said holder being longitudinally elongated and having lateral width greater than its thickness, the sheet extending across the width of the holder,

(e) said flanges having projections integral with their lateral extremities, said projections adapted to interengage and transfer loading from one flange to the other during said flexing, the flanges spaced apart between said projections and said medial web.

4,621,466

FLASHING FRAME FOR THE INSTALLATION OF ADJACENT ROOF WINDOWS

Siegfried Sonneborn, Tangstedt; Manfred Handel, and Ernst Mack, both of Weilheim, all of Fed. Rep. of Germany, assignors to Rasmussen Holding S/A, Soburg, Denmark

Continuation of Ser. No. 468,304, Feb. 22, 1983, Pat. No. 4,543,753. This application May 30, 1985, Ser. No. 739,550

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206871

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.[4] E04D *13/00;* **E04B** *7/18;* **E06B** *1/04*

U.S. Cl. 52—15 **6 Claims**

1. A flashing frame for installing a plurality of adjacent roof windows inside a blind frame in plane of a roof, comprising;

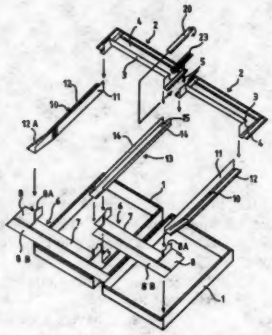
a plurality of upper flashing members each having an upstanding cover flange for covering an upper part of an associated blind frame, a connecting flange adapted to extend beneath the roof after installation, and an obliquely rearwardly bent connecting web at a side edge of said connecting flange;

a plurality of lower flashing members each having an upstanding cover flange for covering a lower part of the associated blind frame, and a connecting flange adapted to extend onto the roof after installation;

a plurality of side parts each having an upstanding cover flange for covering a lower part of the associated blind frame, and a connecting flange which extends beneath the roof after installation;

at least one trough member installed laterally between two roof windows having two upstanding cover flanges for covering the side parts of two adjacent blind frames and at least one connecting bar comprising a cover wall having

side edges at which obliquely rearwardly bent coupling webs are oriented to engage the associated connecting webs of two upper flashing members, at least one inward support projection extending inwardly from said cover wall between said coupling webs adapted to be disposed after installation between opposed edges of the connecting



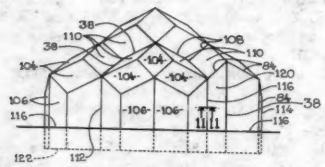
webs engaged by said coupling webs, said support projection having support webs extending substantially vertical to the roof plane after installation and adapted to support said engaged connecting webs of two adjacent flashing members, said connecting bar having a width adjusted to a predetermined lateral installation distance between the opposed edges of said engaged connecting webs.

4,621,467

VERTICAL-WALLED EDGE-CONNECTED PANELIZED CONNECTABLE RHOMBIC TRIACONTAHEDRAL BUILDINGS

Frederick L. Golden, Ann Arbor, Mich., assignor to Eric B. Lipson, Ann Arbor, Mich.

Filed Feb. 24, 1983, Ser. No. 469,226
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—81 **20 Claims**



1. An integrated panel and connector system for modified elongated triacontahedral dome structures comprising in combination foam core rigid plastic faced panels, the cores of the panels recessed along the edges or the panels to form channelled panel edges with the extended panel facings,

144° dihedral angle edge connectors adapted to join two panels together along adjacent panel edges, the sides of said edge connectors spaced apart at 144° relative to each other and sized to engage said channelled panel edges between said extended panel facings, and,

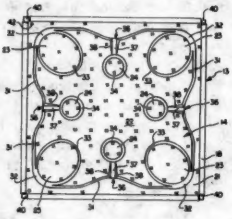
wherein at least two of said panels are rhombic roof panels, at least two of said panels are modified rhombic roof panels with two parallel edges slightly elongated relative to the other two edges and at least two of said panels are wall panels with two parallel edges more than twice the length of the edge joining the parallel edges together.

4,621,468

CONCRETE METAL-BACKED ACCESS FLOOR PANEL

Martin E. Likozar, Rocky River, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Jul. 11, 1984, Ser. No. 629,980
Int. Cl.[4] E04B *5/58*
U.S. Cl. 52—126.6 **13 Claims**



1. A rectangular access floor panel adapted to be supported at its corners and providing a substantially planar load-bearing surface to which loads are applied, comprising a sheet metal pan providing a contoured wall bounded by laterally extending side walls, said metal providing substantial tensile strength, and a non-metallic castable and settable material having a relatively high compressive strength filling said panel and providing said load surface which is the upper structural surface of said panel, said contoured wall providing:

(a) a substantially uniform, maximum thickness of castable material around the border of said panel;

(b) corner portions of said castable material adjacent to the corners of said panel each having a substantial area of substantially uniform minimum thickness;

(c) substantially the entire remaining portions of said castable material having an intermediate thickness,

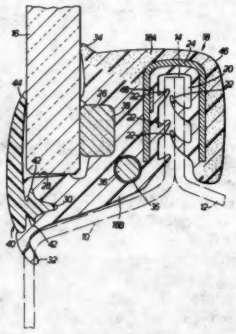
said panel providing substantially uniform deflections when a given concentrated load is applied substantially anywhere along said load surface spaced from the corners of said panel.

4,621,469

WINDOW GLASS FIXTURE ARRANGEMENTS

Werner Krüschwitz, Viersen, Fed. Rep. of Germany, assignor to Draftex Industries Limited, Edinburgh, Scotland

Filed Jul. 11, 1984, Ser. No. 629,721
Claims priority, application United Kingdom, Jul. 26, 1983, 8320059
Int. Cl.[4] E06B *3/62*
U.S. Cl. 52—208 **7 Claims**



1. A window glass mounting and fixing arrangement, comprising

soft flexible material defining a channel for embracing

mounting means running around the window opening and defining a ledge-shaped surface of the flexible material adapted to receive the window glass, the said surface having a first portion for making contact with a side surface of the window glass and which is recessed to receive adhesive for adhering to and securing the window glass in position on the said ledge-shaped surface and a second portion for making contact with the peripheral edge of the window glass, and

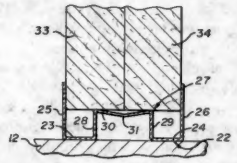
a relatively stiff glass-supporting member, the glass-supporting member having a part which is inserted into a longitudinal slot defined in the flexible material adjacent to the said second portion of the ledge-shaped surface, whereby to mechanically interlock the glass-supporting member with the flexible material so that the glass-supporting member makes contact with the side surface of the window glass which is opposite to the side surface which contacts the said first portion of the ledge-shaped surface and thereby assists in holding the window glass in position, and whereby the insertion of the said part of the glass-supporting member into the longitudinal slot forces the second portion of the ledge-shaped surface into contact with the peripheral edge of the window glass.

4,621,470

RUNNER AND AREA SEPARATION WALL STRUCTURE UTILIZING RUNNER

Henry A. Balinski, Hoffman Estates, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Apr. 2, 1984, Ser. No. 595,626
Int. Cl.[4] E04B *2/84*
U.S. Cl. 52—241 **3 Claims**



1. A wall structure comprising in combination:

1. an integral substantially U-shaped runner comprising:
   (a) a pair of web members having flanges extending from the outer edges thereof and substantially perpendicular thereto,
   (b) an inverted channel comprising a pair of inner flanges one extending from the inner edge of each of said web members, and
   (c) a platform web connected at each edge to an edge of one of said inner flanges, said platform web being spaced at a distance above each of said web members, the center of said platform web being depressed for draining water from the upper surface of said platform web,
2. a gypsum wallboard panel having its entire lower edge positioned in said runner and supported by said platform web in spaced-apart relationship above both of said web members, and
3. A U-shaped channel mounted over and supporting the upper edge of said gypsum wallboard panel

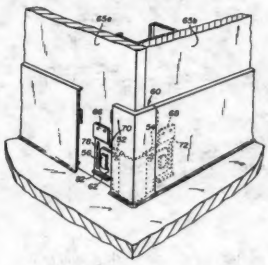
whereby, said platform web supports the lower edge of said gypsum wallboard panel at a distance elevated above said web members sufficient to prevent water which may be present in said runner from contacting the edge of said panel.

4,621,471

BASE TRIM SYSTEM FOR PARTITION CORNERS

Albert F. Kuhr, Elk Grove Village, and Alan C. Wendt, Barrington, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 694,808, Jan. 25, 1985, Pat. No. 4,569,171. This application Feb. 6, 1986, Ser. No. 814,424
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—288 **4 Claims**



1. A base trim system for partition corners comprising a base trim and a mounting bracket for the base trim,

said mounting bracket having two planar upright wings angularly joined at a first edge of each, a recessed attachment flange connected to the opposite edge of each wing and extending laterally away from the associated wing, an upwardly oriented planar hook extending above each attachment flange in a plane parallel to but between the vertical planes of the flange and the wing with which it is associated;

said base trim having two planar upright wings angularly joined at a first edge of each and overlying the corresponding wings of the mounting bracket, a recessed lower flange connected to the opposite edge of each trim wing and fastened to the corresponding attachment flange of the mounting bracket in an overlying relationship;

the attachment flanges of the mounting bracket extending laterally beyond the lower flanges of the base trim and being attached to the intersecting walls which form the partition corner.

4,621,472

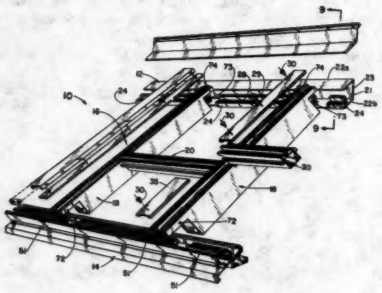
GLAZED STRUCTURAL SYSTEM AND COMPONENTS THEREFOR

Werner Kloke, Whitby, Canada, assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation of Ser. No. 431,047, Sep. 30, 1982, abandoned. This application Jan. 7, 1985, Ser. No. 689,347
Int. Cl.[4] E04B *7/18*
U.S. Cl. 52—397 **14 Claims**

1. In a roof structure, a plurality of rafters arranged in inclined substantially uniformly spaced apart relation and provided with a plurality of opposed recess means therein at uniformly spaced apart intervals therealong and a plurality of purlins extending therebetween with the ends thereof projecting into and fully registered within said opposed recess means of said rafters so as to intersect therewith and be supported therefrom, each said purlins and rafters including longitudinally extending open ended drainage channel means therein and opening upwardly longitudinally centrally therealong, said drainage channel means being defined by a bottom wall upstanding spaced apart outer side walls and flange means extending inwardly from said outer side walls and in spaced apart opposed overlying relation to said bottom wall, each said recess means of said rafters having a perimetral extent within said side walls and flanges means thereof and the respective depths of the channel means of said purlins and rafters being such that in full registration said intersecting flange means of

said purlins and rafters are disposed in substantially coplanar relation and water collected in the channel means of said purlins is discharged therefrom downwardly into the channel means of said rafters at a point inwardly spaced form the side



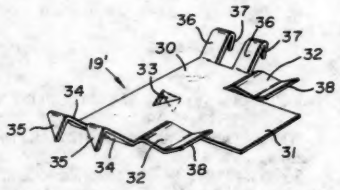
walls of said rafters and connecting means carried by said purlins at the ends thereof for engagement with said channel means of said rafters for securing said purlins and rafters against separation.

4,621,473

FIELD ATTACHMENT CLIP FOR WALL PANELS

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Aug. 3, 1983, Ser. No. 519,850
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—489 **8 Claims**



1. An integral clip adapted to attach wall panels having surfaces to supporting studs having flanges adapted to be positoned subjacent and parallel to the surfaces of said wall panels, said clip comprising:

a substantially planar portion adapted to be positioned in immediate juxtaposition with a surface of one of said wall panels to be attached to said flanged stud;

clip members integral with and struck from said planar portion and extending therefrom, a tongue extending at one end of and coplanar with said planar portion and positioned intermediate said clip members, said clip members being generally arcuately formed for receiving and frictionally engaging the flange of said stud and forcing it against said tongue, and

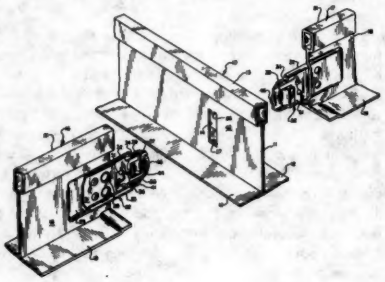
impaling point-supporting fingers extending from opposite edges of said planar portion at an obtuse angle thereto and having impaling points at the ends thereof adapted to be impaled into the surface of said panel.

4,621,474

GRID CONNECTORS FOR SUSPENSION CEILING

Robert F. Worley, Bay Village, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Jul. 25, 1985, Ser. No. 758,791
Int. Cl.[4] F16B *7/22*
U.S. Cl. 52—667 **11 Claims**



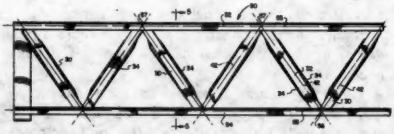
1. A suspension ceiling grid system comprising elongated runners providing a central web with oppositely extending flanges extending from one edge of said web, said runner being adapted to be interconnected at intersections to provide through-runner and opposed and aligned runner ends connected on opposite sides of said through-runner, said through-runner providing a connector opening in its web, said runner ends providing connectors extending longitudinally from the ends thereof, said connectors being insertable into said connector opening from opposite sides thereof by longitudinal movement of said runner ends, said connector opening and said connector being structured so that said connector is laterally movable in said opening in a direction aligned with the length of said through-runner between a release position and a locked position, said connectors providing rearwardly facing surfaces proportioned to fit through said connector opening when said connectors are in a release position and to engage the remote side of said through-runner web and prevent withdrawal of said connector when said connectors are in a locked position, and separate spring means operable when said connectors are inserted into said connector opening to move said connectors laterally from said release position to said locked position, said separate spring means permitting movement of said connector back to said release position when a lateral force is applied to said runner ends for removal of the connectors from said connector opening.

4,621,475

STRUCTURAL STRUT AND TRUSS FORMED THEREFROM

Robert W. McClain, Dallas, Tex., assignor to Glitsch, Inc., Dallas, Tex.

Filed Aug. 9, 1982, Ser. No. 406,559
Int. Cl.[4] E04C *3/02*
U.S. Cl. 52—693 **14 Claims**



11. A truss comprising:

a pair of upper flanged chord members secured one to the

other in back-to-back relationship having a common neutral axis;

a pair of lower flanged chord members secured one to the other in back-to-back relationship and having a common neutral axis, said upper and lower chord members lying in and defining a primary plane of said truss;

a plurality of strut members extending between and attached to said upper and lower chord members, said struts each comprising a pair of generally planar elongated webs, each web having frontal and back surfaces, secured one to the other in back-to-back relationship with opposite ends thereof being in generally coplanar attachment with said flanged chord members, and further having flanges of tapered height and of opposed slant each flange extending outwardly of said web along said frontal surface thereof substantially in a single tapered slant which is opposite to said other flange, said flanges being disposed along opposite sides of said web to thereby skew the neutral axis of said struts with respect to the geometric axis of said web to facilitate point intersection of the nuetral axis of adjacent struts and said attached chord;

said flanges of said chords and struts extending generally transversely to said primary plane of said truss; and

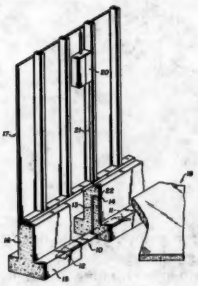
said flanges of said struts extending for a distance less than the length of said webs with coplanar flange-free areas formed on the webs at each end thereof to facilitate coplanar attachment of the strut to said flanged chord members in generally angular engagement therewith.

4,621,476

GROUNDING ELECTRODE

Harvey J. MacGregor, 14700, 110th Avenue, Surrey, British Columbia, Canada (V3R 2A8)

Filed Aug. 2, 1985, Ser. No. 761,954
Claims priority, application Canada, Feb. 8, 1985, 473895
Int. Cl.[4] H01R *4/66*
U.S. Cl. 52—741 **5 Claims**



1. In a method of providing a grounding electrode in the construction of a building, the construction including forming a foundation by pouring concrete footings, then forming a foundation wall on the footings, the improvement comprising locating in the space to receive the footings, before the concrete to form the footings is poured, a grounding electrode comprising the steps of:

(i) placing in said space an elongated metal plate dimensioned to lie within said space;

(ii) orienting a metal rod secured to said plate extending upwardly to a position above the footings, for connection to an electrical system;

(iii) pouring concrete to form the footings to enclose and locate the elongated metal plate; and

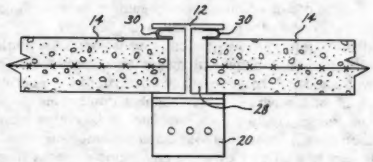
(iv) forming the foundation wall on the footings with the metal rod extending from the wall, above the footings to connect to the electrical system.

4,621,477

WALL PANEL SYSTEM

Dennis I. Kinst, 8845 Burlington, Brookfield, Ill. 60513

Filed Jul. 18, 1985, Ser. No. 756,292
Int. Cl.[4] E04C *2/54*
U.S. Cl. 52—780 **7 Claims**



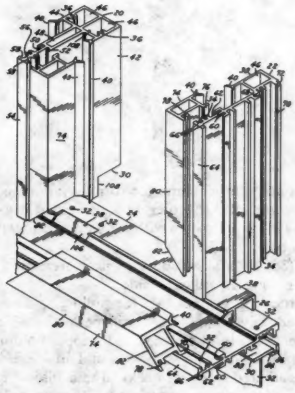
1. An assemblable temporary wall unit construction comprising at least a pair of horizontally spaced vertical H-beam members forming columns, a plurality of preformed stackable panels positionable between and bridging said beam columns, the spacing between said beam columns being such that the panels can be inserted horizontally by positioning one end of the panel adjacent one of said beam columns, aligning the panel with the other beam column and shifting said panel horizontally to bridge the spaced columns, and wedge like filler members being removably insertable and accessibly located between the panels and beam columns for rigidly holding and confining the panels in a removable manner with respect to said beam columns in order to permit easy assembly and disassembly of said wall construction.

4,621,478

EXTRUDED PLASTIC FLUSH STOP WINDOW MULLION AND FRAMING SYSTEM

H. V. Phillips, Brighton, and Michael A. Walton, Dexter, both of Mich., assignors to NRG Industries, Inc., Ann Arbor, Mich.

Filed Feb. 14, 1984, Ser. No. 580,068
Int. Cl.[4] E04C *2/34*
U.S. Cl. 52—775 **11 Claims**



1. An extruded plastic window framing system comprising at least two differing asymmetric peripheral framing members and at least two separate differing glass retainers attachable to any of said peripheral framing members,

each of said peripheral framing members comprising in profile a single integral glass retainer and a web extending asymmetrically therefrom, a pair of integral symmetric in profile engagement means on said web spaced from said

integral glass retainer and located on either side of said web, and glass engagement means on said integral glass retainer,

a third integral engagement means located in profile on the opposite side of each of said asymmetric framing members from said integral glass retainer and spaced from said pair of integral engagement means,

each of said pair of integral engagement means being symmetric to the other about said web,

said third integral engagement means being symmetric to said integral engagement means on the same side of the web about a transverse plane equidistant therebetween,

each of said separate glass retainers comprising in profile integral engagement means, said engagement means of each of said separate glass retainers being complementary to any of said pair or third engagement means on either side of each of said peripheral framing members and glass engagement means on each of said separate glass retainers, and,

wherein in profile said two differing peripheral framing members differ therebetween in the location of said glass engagement means relative to the web, and said two differing separate glass retainers differ therebetween in the location of said glass engagement means relative to the complementary engagement means of each of said separate glass retainers.

4,621,479

BAG TYING MACHINE

Trevor B. Hoyland, Norfolk, United Kingdom, assignor to Thurne Engineering Company Limited, Norwich, England

Filed Nov. 18, 1985, Ser. No. 799,240

Claims priority, application United Kingdom, Nov. 16, 1984, 8428986

Int. Cl.[4] B65B *51/08*

U.S. Cl. 53—133 **10 Claims**

1. An automatic machine for forming an adhesive tape tie around the gathered together neck of a filled bag comprising:

means (**17**, **18**) defining a path for gathered together necks of filled bags;

means (**36**) to hold a supply of pressure sensitive adhesive tape having an adhesive side;

a reciprocating gripper (**41**) for pulling said pressure sensitive adhesive tape across said path of said gathered together necks of filled bags, said gripper holding said adhesive tape across said path with said adhesive side towards said gathered together necks of said filled bags;

means for forming and applying one limb of folded V-shaped tabs (**48**) of non-adhesive tape (**42**) at intervals to said adhesive side of said adhesive tape on its passage from said means to hold a supply to said gripper, each said V-shaped tab being located along said adhesive tape at a point that subsequently forms a first end of a tie;

a cutter (**40**) which cuts said adhesive tape immeditely adjacent each said tab to form each individual tie with said first end and a second end; and,

clamping means (**34**, **35**) for clamping said adhesive side of said adhesive tape around said gathered together neck and onto itself to form an adhesive tape tie, said clamping means bringing said second end of said adhesive tape into adhering contact with the other limb of said V-shaped tab to provide a pilfer proof tie with said V-shaped tab of non-adhesive tape secured across both said first and second ends of said adhesive tape forming each said tie, wherein said means for forming and applying said V-shaped tabs includes;

a tape guide (**38**) for supporting the side of said adhesive tape opposite said adhesive side upstream of said clamping means along the path of said adhesive tape;

a barrier (**46**) adjacent said adhesive side of said adhesive tape and downstram of said tape guide along the path of said adhesive tape;

feed means (**44**) to feed said non-adhesive tape to the side of said barrier remote from said adhesive tape; and

a pusher (**47**) to push and attach together said non-adhesive tape and said adhesive side of said adhesive tape upstream of said barrier along the path of said adhesive tape, said V-shaped tab forming means also comprising said gripper that moves said adhesive tape and the attached non-adhesive tape towards said clamping means by drawing said non-adhesive tape over said barrier and folding it against itself to form said V-shaped tab.

4,621,480

TRANSFER DEVICE FOR WRAPPING MACHINES

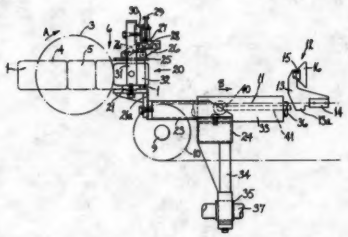
Franco Aiuola, and Luciano Nannini, both of Bologna, Italy, assignors to Azionaria Costruzioni Macchine Automatiche (ACMA), Bologna, Italy

Filed Jul. 18, 1984, Ser. No. 632,091

Claims priority, application Italy, Aug. 8, 1983, 3530 A/83

Int. Cl.[4] B65B *11/28*

U.S. Cl. 53—234 **3 Claims**



1. A machine for wrapping blocks of approximately parallelepiped shape comprising:

(a) an intermittently rotating drum having diametrically opposed seatings for receiving the blocks and performing initial wrapping of said blocks;

(b) a conveyor means for conveying blocks into said drum and including means forcing the partially wrapped blocks out of said drum;

(c) a transfer means for receiving the blocks from said drum;

(d) said transfer means including a hopper and means mounting said hopper for movement from a position receiving the blocks from said drum to downstream position; means to reciprocate said transfer means in a direction radial to said drum to said downstream position; said transfer means including means for further wrapping said blocks;

(e) transport means carried on said mounting means and comprising a conveyor having pushers that contact the wrapped blocks at the downstream position to transport the blocks away from said transfer means for further downstream processing;

(f) said transfer means including a lower support plate and a resiliently mounted upper support plate urged toward said

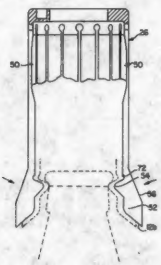
lower support plate and adjustable to vary the spacing between said support plates.

4,621,481

CLOSURE HEAD FOR SECURING A SEALING CAP TO A CONTAINER

Sven-Ake Magnusson, Kungalv, Sweden, assignor to Wicanders AB, Alvangen, Sweden

Filed Jul. 2, 1985, Ser. No. 751,246
Claims priority, application Japan, Jul. 31, 1984, 59-159441
Int. Cl.[4] B67B *3/14*; B65B *7/28*
U.S. Cl. 53—345 **4 Claims**



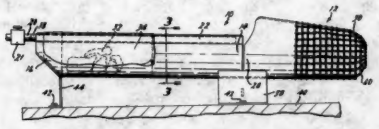
1. A closure head for securing a sealing cap having a disc-like top and a cylindircal skirt to a container comprising a central plunger, slidable in a counter-pressure plunger between extended and retracted positions with respect thereto, a spring normally urging said central plunger to the extended position, a closure sleeve composed of a plurality of arms surrounding the counter-pressure plunger, each having at the free end thereof a clamp shoe provided with an inwardly projecting clamp rim and a radially directed inclined surface, a support sleeve for carrying said counter-pressure plunger and closure sleeve, a casing surrounding the support sleeve and supporting the latter therein, said casing being provided with a wear ring having an inclined surface in sliding contact with the inclined surface on the clamp shoes for closing the container upon sliding movement of the inclined surfaces of the clamp shoes along the wear ring, characterized in that each inwardly projecting clamp rim has a recess extending thereinto from the surface thereof, said recesses being circumferentially spaced to provide projections around the skirt of a cap when it is being secured to a container by sliding movement of said inclined surfaces along said wear ring.

4,621,482

METHOD AND APPARATUS FOR FORMING NETTED MEAT PRODUCTS WRAPPED IN AN EDIBLE COLLAGEN FILM

Gary A. Crevasse, Rochester Hills; David L. Gammon, Rochester, and Michael J. Sullivan, Rochester Hills, all of Mich., assignors to Naturin-Werk Becker & Co., Fed. Rep. of Germany

Filed Apr. 18, 1985, Ser. No. 724,817
Int. Cl.[4] B65B *13/20, 11/58*
U.S. Cl. 53—439 **9 Claims**



1. A method for making netted meat products comprising the steps of:

(1) placing a sheet of film on an open ended trough defined by at least two upright side walls and placing a netting on one end of an extrusion member with the other end of the member connected to said trough;

(b 2) depositing meat products upon said film whereby the weight of the meat products causes the sheet to substantially conform to the walls of the trough thereby at least partially enveloping the meat products;

(3) folding the edges of the sheet over the top of the meat products to substantially enclose said meat products with said sheet;

(4) lubricating the surfaces of said trough and extrusion member that contact said sheet during movement of the wrapped meat product therethrough; and,

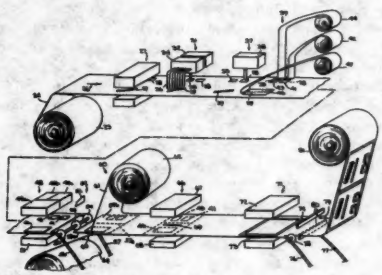
(5) forcing said wrapped meat products from the trough through said extrusion member and into said netting.

4,621,483

INFLATABLE POUCH AND METHOD OF MANUFACTURE

David J. Magid, Doylestown, Pa., assignor to Enviro-Spray Systems, Inc., Montgomeryville, Pa.

Continuation of Ser. No. 290,256, Aug. 5, 1981, Pat. No. 4,478,044. This application Jul. 16, 1984, Ser. No. 631,068
Int. Cl.[4] B65B *43/04, 31/10*
U.S. Cl. 53—455 **2 Claims**



1. A method of assembling a self-inflating plastic pouch comprising the steps of:

(1) delivering a longitudinal web of plastic sheet material to a first station,

(2) folding said web along its longitudinal center line to provide a substantially vertical portion and a flat portion,

(3) placing a first packet containing a plurality of staggered recesses containing a first gas generating component on said flat portion and heat sealing it to said flat portion,

(4) placing a burstable water packet and a water soluble PVA packet containing a second gas generating component on said flat portion adjacent said first packet,

(5) folding said vertical portion over said flat portion to enclose all said packets,

(6) sealing said first packet permanently to said folded over portion along a line extending longitudinally of said first packet adjacent one side portion thereof,

(7) sealing said web portions together to form a sealed envelope containing said packets, and

(8) severing said envelope from said web.

4,621,484

METHOD OF MAKING A FOLDED UP EGG PACK

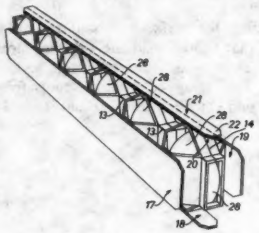
Toni Casutt, Blumenrain 24, CH-8702 Zollikon, Switzerland

Filed May 24, 1985, Ser. No. 737,826

Claims priority, application Switzerland, May 25, 1984, 2578/84

Int. Cl.[4] B65B *23/04*

U.S. Cl. 53—456 **3 Claims**



1. Method of making, out of cardboard blanks, a pack for eggs or other fragile articles, comprising the steps of:

cutting and slitting a first blank with parallel slits defining external cover strips for said pack, joined together in said first blank only at their ends, by cross strips;

cutting, slitting and scoring a second blank, longer and narrower than said first blank, with parallel lengthwise interrupted slits for forming wave strips joined laterally at their wave crests along scored boundaries,

said wave strips of said second blank including a bottom wave strip in the center of said second blank, side wave strips laterally adjoining said bottom wave strips in said second blank and top wave strips, each having half the width of said bottom wave strip, running along the respective side edges of said second blank laterally adjoining the respective side wave strips,

said cover strips of said first blank including, in a mid-portion of said first blank, strips respectively corresponding in width and relative position to said bottom and side wave strips of said second blank, a cover strip at first side edge of said first blank corresponding in width to one of said top wave strips of said second blank and a second cover strip at the second side edge of said first blank having a width sufficient to include a first cover portion of a width corresponding to one of said top wave strips of said seocnd blank for bracing said top wave strip and a second free edge portion extending laterally beyond said first cover portion to said second side edge of said first blank, for ultimately overlapping the cover strip at said first side edge portion of said first blank shaping said wave strips;

applying a hot-sticking adhesive in crosswise ribbons or beads on said first blank in locations pre-selected for gluing said wave strips of said second blank to said cover strips of said first blank to form separating support racks for pack contents, which racks are respectively braced on corresponding cover strips of said first blank, and at the same time applying hot-sticking adhesive to said free edge cover strip portion by extending said crosswise ribbons or beads of adhesive across the entire width of said first blank

gluing said wave strips of said second blank to said cover strips of said first blank by bending said second blank along crosswise scoring thereof to form flat wave hollows and wave crests, superimposing flat wave hollows defined by scoring and bending of said second blank on said ribbons or beads of adhesive on said first blank while said adhesive confined between said first blank and said wave hollows of said second blank is hot, followed by cooling whereby a nonsticking state of adhesive on said free edge cover strip portion is assured;

cutting off said cross-strips of said first blank to separate said cover strips;

folding said side wave strips at substantially 90 degrees relative to said bottom wave strip on lengthwise scoring of said second blank to form pockets defined by rack structures by said bottom and side wave strips;

inserting eggs or other fragile articles in said pockets;

applying heat to warm said adhesive on said free edge cover-strip portion and make it sticky for bonding;

folding said top wave strips relative to said side wave strips at substantially 90 degrees on lengthwise scoring of said second blank to enclose said pockets, and

holding the side cover strips to bring said top wave strips together while pressing said free edge portion of said first blank, having said hot-sticking adhesive applied thereto, over and against the top cover strip originally located at the opposite lateral edge of the first blank and then allowing the adhesive to cool and to establish a bond before releasing to completed pack.

4,621,485

APPARATUS FOR PROCESSING AND SUPPLYING CONTAINERS OF BOXES TO THE OUTLET OF TUBE-FILLING MACHINES, PARTICULARLY FOR USE WITH TUBE-FILLING AND BOXING MACHINES

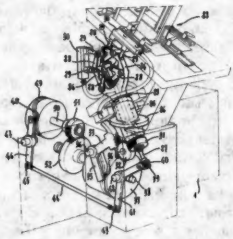
Ivo Argazzi, Pianoro Nuova, Italy, assignor to I.M.A. - Industria Macchine Automatiche S.p.A., Ozzano Emilia, Italy

Filed Jun. 27, 1985, Ser. No. 749,878

Claims priority, application Italy, Jul. 18, 1984, 3530 A/84

Int. Cl.[4] B65B *43/30*

U.S. Cl. 53—564 **2 Claims**



1. In a tube-filling and boxing machine of the type comprising a hopper containing horizontally disposed preformed crushable tubes with open bases, positively acting means designed to take up these tubes having open bases in individual sequence so as to supply them in a similar individual sequence to positive gripper means for transfer to further gripper means for orientating and transferring these tubes with their bases upwardly open and disposed vertically to resilient take-up means associated with endless conveyor means in a horizontal plane with a successive step movement forming a processing line along which the said tubes are checked, filled and sealed at their base by flattening and crushing of their base zone, means designed to take up blanks and simultaneously to form packaging boxes with filling apertures upwardly open, additional gripper means designed to take up the closed and sealed tubes by taking them up at the location of the flattened base from the processing line and to transfer them into a respective box through its filling aperture, means designed to close the filling apertures of the boxes, and an apparatus for processing and supplying the boxes to a boxing machine section of the tube-filling and boxing machine, the improvement wherein said apparatus comprises a forked body having substantially coplanar prongs supported in an inclined and freely rotatable manner at a location of a shank of the forked body, kinematic articulated lever means associated with a respective prong of the forked portion of this body supported in an inclined and freely rotatable manner, suction means controlled by the kine-

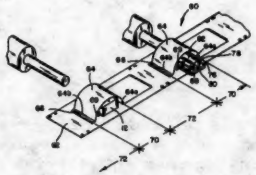
matic articulated lever means, means for the simultaneous control of the said kinematic articulated lever means, first actuation means for actuating the forked body in an oscillating manner in both directions and second actuation means for actuating the means for the simultaneous control of the kinematic articulated lever means.

4,621,486

APPARATUS FOR MAKING A TAPE CARRIER

Donald Slavicek, Lombard, Ill., assignor to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 671,397, Nov. 15, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 795,048
Int. Cl.[4] B65B *11/00*
U.S. Cl. 53—580 **3 Claims**



1. An apparatus for making a flexible substrate assembly which includes

an elongated flexible substrate having a plurality of spaced apart component-receiving regions, a plurality of solid components disposed on said substrate, one on each region, and

a plurality of pairs of aligned spaced-apart generally longitudinally extending slits formed in said substrate, each defining flexible strap means having one end adjacent each region on one side thereof and a second end adjacent the opposite side of said region, integrally joined by connection portions overlying said regions to form a tube-like passageway for receiving and containing said components, the apparatus comprising

a work station whereat said assembly is made;

means for presenting the substrate to the work station;

means for cutting the substrate to form said strap means;

means for lifting said strap means from said substrate to provide entry into said component-receiving passageway;

means for inserting said component between said strap means and said substrate wherein said cutting means cuts the second end of said strap means free of said substrate, said apparatus further comprising means for joining the free end of said strap means to said substrate to form said tube-like passageway.

4,621,487

HAYING MACHINES FOR FACILITATING TRANSPORT THEREOF

Jean-Pierre Urlacher, and Denis Lang, both of Saverne, France, assignors to Kuhn S.A., Saverne, France

Continuation of Ser. No. 622,531, Jun. 20, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 821,014
Claims priority, application France, Jul. 7, 1983, 83 11485
Int. Cl.[4] A01D *77/00*
U.S. Cl. 56—228 **6 Claims**

1. A haymaking machine convertible between an operating and a transporting position comprising:

a chassis,

a plurality of rotors mounted side-by-side on said chassis for displacing plants on the ground,

a beam mounted above said chassis,

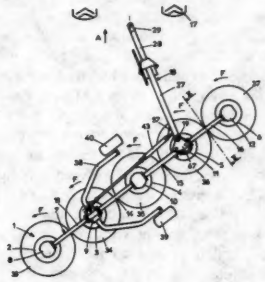
a shaft pivoted to said beam for coupling the machine to a pulling vehicle,

a retractable support mounted on said beam,

wheels mounted on said support for carrying said machine when in the transporting position, said wheels being movable to a position in which they are substantially level with said chassis when said machine is in the operating position,

a rod connecting said retractable support to said shaft,

a hydraulic jack, one end of said hydraulic jack being connected to said beam and the other end of said hydraulic jack being connected to said retractable support,



and a single locking device arranged to stop both said retractable support and said chassis with respect to said shaft in operative position or in transport position of said machine,

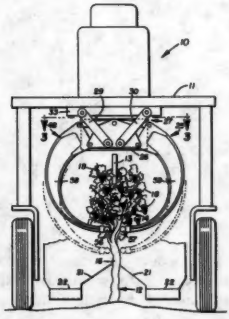
whereby upon actuation of said hydraulic jack, said hydraulic jack displaces said chassis with respect to said shaft and said retractable support with respect to said chassis.

4,621,488

OSCILLATORY SHAKER RAIL HARVESTER

Gerald L.. Claxton, Fresno, Calif., assignor to Up-Right, Inc., Berkeley, Calif.

Filed Jul. 31, 1984, Ser. No. 636,158
Int. Cl.[4] A01D *46/26*
U.S. Cl. 56—330 **18 Claims**



1. A picking head for a harvesting machine having a wheeled main frame adapted to straddle and move along a row of plants which have vertical trunks spaced along the row, with the longitudinal centerline of said main frame being in general alignment with the length of the row, said picking head comprising:

an elongated picking head frame extending lengthwise of said main frame,

first and second longitudinally-spaced rail supports, each rail support having an inverted-C-shape with lower opposed ends and an upper mid-portion spaced above said ends,

means for mounting the mid-portion of each of said rail supports to said picking head frame for unitary movement therewith,

a pair of spaced apart and longitudinally-extending shaker rails mounted on the lower opposed ends of said rail supports,

first and second longitudinally-spaced counterweight sets mounted on said picking head frame for rotation about vertical axes, each set having upper and lower eccentric weights,

drive means for driving said counterweight sets with the direction of rotation of said first set being opposite to the direction of rotation of said second set, with the rotative forces of said upper weights of said first and second sets being opposed to each other longitudinally of said picking head frame and additive to each other transversely of said picking head frame, with the rotative forces of said lower weights of said first and second sets being opposed to each other longitudinally of said picking head frame and additive to each other transversely of said picking head frame, and with the upper and lower weights of each set being 180° out of phase with each other, and

means for mounting said picking head frame on said main frame for oscillatory pivotal movement of said picking head frame relative to said main frame.

4,621,489

TEXTILE FABRIC UTILIZING CORED YARNS

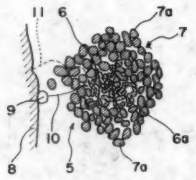
Hozuma Okada, Kyoto, Japan, assignor to Sakashita Co., Ltd., Kyoto, Japan

Filed Apr. 8, 1985, Ser. No. 721,214

Claims priority, application Japan, Apr. 7, 1984, 59-69810

Int. Cl.[4] D03D *15/00*; D02G *3/36*

U.S. Cl. 57—210 **2 Claims**



1. A textile fabric woven or knitted by the use of cored yarns, each of said cored yarns comprising a thread wadding, composed by a bundle of inner fibers having a high water retentivity, and a thread sheath composed of a plurality of outer fibers arranged exteriorly of the thread wadding so as to substantially completely enclose the inner fibers, said outer fibers having a high moisture permeability and a low water retentivity, said inner fibers being substantially completely encompassed by the outer fibers in a predetermined thickness while permitted to expand upon absorption of water or moisture vapor and wherein the ratio of the weight of the inner fibers relative to that of the outer fibers is within the range of 69/31 to 48/52, and wherein each of said outer fibers has a denier within the range of 1.0 to 2.3, and each of said cored yarn has a yarn count of not greater than No. 60.

4,621,490

METHOD AND APPARATUS FOR PRODUCING A FASCIATED YARN

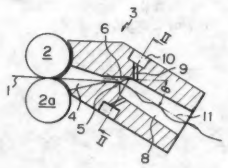
Susumu Kawabata, Aichi; Hiroshi Niimi, Nagoya; Meiji Anahara, Kariya, and Hiroshi Omori, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi, Japan

Filed Jul. 14, 1983, Ser. No. 513,845

Claims priority, application Japan, Jul. 21, 1982, 57-125852

Int. Cl.[4] D01H *5/28, 5/18*; D02G *1/04, 1/16*

U.S. Cl. 57—328 **9 Claims**



1. An apparatus for producing a fasciated yarn having an air nozzle for imparting a false twist to a fiber bundle to be treated, said nozzle comprising a fiber passage in which an inlet portion, a small channel, and a large channel are successively arranged in the downstream direction along a traveling route of said fiber bundle, said large channel being provided with at least one jet pointing tangentially along said fiber passage, said apparatus being characterized in that the axis of said large channel is straight throughout the entire length of said large channel, the axis of said small channel intersects with the axis of said large channel at an angle θ to form at least one contact area in said small channel for ensuring continuous contact between the fiber bundle and said small channel, and said contact area is provided on an inner wall of said small channel at a portion near the longitudinal axis of said large channel.

7. A method for producing a fasciated yarn in which a fiber bundle delivered in a ribbon shape from a draft means is introduced into a fiber passage of an air nozzle, said passage comprising an inlet portion, a small channel, and a large channel, the small channel having a longitudinal axis which intersects at an angle θ with the longitudinal axis of the large channel, the axis of the large channel being straight throughout its length, wherein the fiber bundle is false-twisted by a vortex to form said fasciated yarn, said method being characterized by the steps of passing the fiber bundle through the small channel, forcibly pressing the fiber bundle from the small channel against at least one contact area provided on an inner wall of the small channel near the longitudinal axis of the large channel to ensure continuous contact between the fiber bundle and the small channel, and passing the fiber bundle which has been forcibly pressed against said at least one contact point through said large channel.

4,621,491

METHOD OF DISCRIMINATING FITTING PRESSURE FOR LINKS ON A TRACK PRESS

Yasumitsu Moriki; Akira Tanaka, and Izumi Takahashi, all of Tokyo, Japan, assignors to Maruma Jyusharyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 748,001

Int. Cl.[4] B21L *9/06*

U.S. Cl. 59—7 **3 Claims**

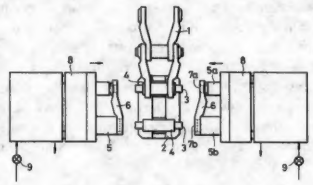
1. A method of discriminating fitting pressure during an assembly operation for articulated track links on a track press essentially comprising the steps of:

detecting loading pressure in a ram during assembling operation of a link,

comparing the detected loading pressure with a lower limit pressure value as well as a upper limit pressure value both

of which are predetermined with reference to a range of fitting pressure specified for the link,

predetermining allowable time in which loading pressure in execss of the predetermined upper limit pressure value can be loaded, and



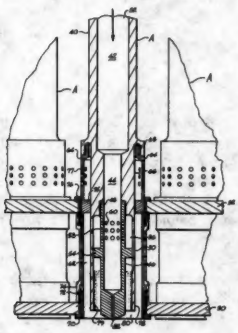
carrying out discrimination in dependence on whether or not a sum of pressure loading time at a level of loading pressure higher than the predetermined lower limit pressure value during the pushing operation of the track press is longer than a predetermined time, while excess pressure appearing within the allowable time during the pushing operation of the track press is neglected.

4,621,492

LOW LOSS INJECTOR FOR LIQUID PROPELLANT ROCKET ENGINES

George L. von Pragenau, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 10, 1985, Ser. No. 690,273
Int. Cl.[4] F02K *9/00*
U.S. Cl. 60—258 **23 Claims**



1. A low pressure loss fuel injection element for use in the main combustion chamber of a rocket engine comprising:

an elongated lox post having a first central passage with a non-restricted inlet opening leading into said lox post passage;

a cylindrical barrel extending from said lox post on an end remote from said lox inlet opening;

a lox plug carried by said lox post having a second central passage in coincident axial alignment with said first central passage of said elongated lox post;

said barrel providing a first boundary wall surrounding said lox plug defining a first annular passage between said boundary wall and said plug;

lox metering means formed in said lox plug through which lox is delivered and metered from said central passage to said first annular passage;

second boundary wall means surrounding said first boundary wall means defining a second annular passage coaxial with said first annular passage and said second central passage;

said barrel having its inside and outside surfaces roughened for inducing turbulent layers between the jets of lox and gas emerging from said first and second annular passages; and

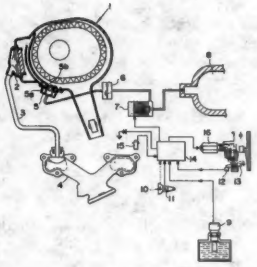
gas metering means formed in said second boundary wall for metering and delivering a flow of hot gases through said second boundary wall means into said second annular passage.

4,621,493

SECONDARY AIR SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yukuo Matsunaga, Ebina, and Hajime Kawasaki, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 14, 1984, Ser. No. 640,605
Claims priority, application Japan, Sep. 30, 1983, 58-183676
Int. Cl.[4] F01N *3/22*
U.S. Cl. 60—290 **5 Claims**



1. A secondary air supply system for an internal combustion engine including an exhaust system, comprising:

means for suspending supply of fuel to the engine when a predetermined operating condition of the engine is satisfied;

a source of secondary air;

a one-way valve;

a secondary air supply passage having one end communicating with said source of secondary air via said one-way valve and an opposite end communicating with the exhaust system of the internal combustion engine;

a secondary air shut off valve closing fluid flow communication between said source of secondary air and said one-way valve;

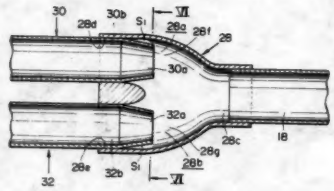
a temperature sensor means for sensing temperature of the engine and generating a sensor output indicative of the sensed temperature; and

a control unit including first means responsive to said sensor output for opening said secondary air shut off valve when said sensor output satisfies a predetermined temperature condition of the engine, and second means for opening said secondary air shut off valve when said predetermined operating condition of the engine is satisfied even when said predetermined temperature condition of the engine fails to be satisfied.

4,621,494
AUTOMOTIVE ENGINE EXHAUST SYSTEM

Kazunori Fujita, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Aug. 10, 1984, Ser. No. 639,426
Claims priority, application Japan, Aug. 31, 1983, 58-161116
Int. Cl.[4] F02B 27/02; F01N 7/10
U.S. Cl. 60—313 7 Claims

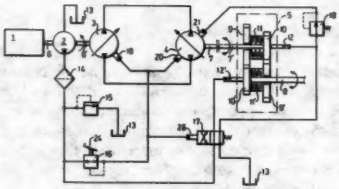


1. An exhaust system for an automotive engine comprising:
a pair of front exhaust pipes;
a rear exhaust pipe located downstream of said front exhaust pipes;
an exhaust pipe joint joining said front exhaust pipes to said rear exhaust pipe and trifurcated to have two upstream branches with striaght bore portions in which said front exhaust pipes are snugly fitted and one downstream branch in which said rear exhaust pipe is fitted;
said front exhaust pipes having downstream end portions projecting into said exhaust pipe joint and also having outer walls, said upstream branches of said exhaust pipe joint having inner walls surrounding said outer walls; and
means including said inner walls and said outer walls cooperating to form annular spaces around said downstream end portions for receiving reflected waves travelling in the upstream direction and limiting the propagation of said reflected waves into said downstream ends of said front exhaust pipes.

4,621,495
SYNCHRONIZED MECHANICAL-HYDROSTATIC GEARBOX

Bo Hedlund, Söderhamn, Sweden, assignor to Stensele Mekaniska Verkstad AB, Sweden

Filed Jun. 26, 1984, Ser. No. 625,005
Int. Cl.[4] F16H 39/46
U.S. Cl. 60—447 9 Claims

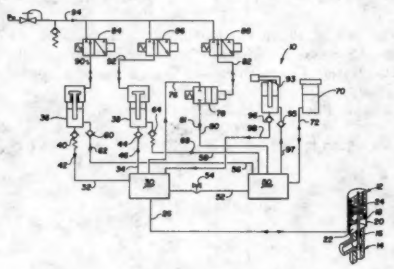


1. A synchronized mechanical-hydrostatic gearbox with infinitely variable drive ratio, including a hydrostatic gear with a hydraulic transmission motor of variable displacement, a mechanical gearbox mechanically connected to said hydraulic transmission motor and having at least two gear ratios, means for supplying a control pressure to said transmission motor, a first setting means for said transmission motor connected to said means for supplying a control pressure to change the displacement of said transmission motor in response to the control pressure, a gear selection valve also connected to said means for supplying a control pressure to be operated by said control pressure in such a way that the gear ratio of the mechanical gear is changed by a predetermined step, downwards to a gear for higher speed, when the displacement of the hydraulic transmission motor reaches its minimum value, and upwards to a gear for lower speed when the displacement of said motor reaches its maximum value, and a second setting means for said transmission motor connected to said means for supplying a control pressure for counteracting, on alteration of the mechanical gear ratio, the alteration of said motor's displacement by the first setting means, and for changing the latter displacement such that the rotational speed of the output shaft from the hydrostatic gear is changed in correspondence with the change in the gear ratio of the mechanical gearbox.

4,621,496
ACTUATOR CONTROL SYSTEM

C. Paul Lamb, Dallas, Tex., assignor to Teledyne Industries, Inc., Garland, Tex.

Filed Apr. 19, 1984, Ser. No. 601,902
Int. Cl.[4] F16D 31/02
U.S. Cl. 60—479 4 Claims



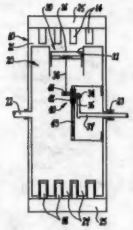
1. In a fluid control system for use in controlling the position of a follower such as a valve or the like comprising:
a closed fluid manifold containing a fixed volume of fluid;
a variable volume actuator connected in fluid communication to said manifold;
means operably connected to said actuator for resiliently biasing said actuator;
means coupling the follower to said actuator to selectively and precisely move said follower in response to changes in volume in said actuator whereby said follower is moved precisely as the fluid is added to or removed from said manifold; and
a first fluid pump for selectively adding a set volume of fluid to said manifold thereby to move said follower a predetermined distance in one direction;
a second fluid pump for selectively removing a set volume of fluid from said manifold thereby to move said follower a predetermined distance in the opposite direction;
said first and second pumps each comprising a pump body defining a fixed volume chamber including a reciprocable plunger disposed therein, supply-discharge means for supplying fluid to said chamber and for discharging fluid from said chamber, reciprocating means for selectively reciprocating said plunger in said chamber to discharge a set volume of fluid from said pump body; and
coupling means including said supply-discharge means coupling said first and second pumps to said manifold and for maintaining the set volume added to or removed from said manifold by first and second pumps respectively independent of the fluid pressure in said manifold.

4,621,497

HEAT ENGINE

Malcolm B. McInnes, Burwood East, Australia, assignor to Pyrox Limited, Victoria, Australia

Continuation of Ser. No. 435,735, Oct. 21, 1982, abandoned.
This application May 15, 1985, Ser. No. 734,745
Claims priority, application Australia, Oct. 22, 1981, PF1261
Int. Cl.[4] F02G 1/04
U.S. Cl. 60—519 21 Claims



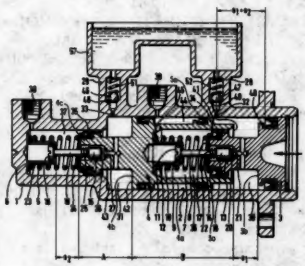
1. A heat engine including: a closed case having internal walls defining a chamber and heat transfer surfaces located around the internal walls; a displacer rotatably mounted within the chamber and defining a relatively large working space between the displacer and the internal walls, the working space being moved around the chamber internal walls as the displacer rotates within the chamber, the working space in use containing a volume of working fluid arranged to cooperate with the heat transfer surfaces and thus to be subjected to changes in thermodynamic parameters; volume altering means operative to cyclically increase and decrease the volume of a portion of said working space in a predetermined manner as the displacer rotates within the chamber, the volume of said working space less the volume of said portion thereof being of significant magnitude relative to the volume of said portion at all times as the displacer rotates within said chamber.

4,621,498

TANDEM MASTER CYLINDER

Ernst-Dieter Schaefer, Bad Nauheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 544,840, Oct. 24, 1983, abandoned.
This application Jun. 10, 1985, Ser. No. 742,918
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1982, 3240542
Int. Cl.[4] B60T 11/20
U.S. Cl. 60—562 5 Claims



1. A tandem master cylinder for a hydraulic brake system of a vehicle comprising:

a cylinder housing including a stepped bore having a large diameter portion and a small diameter portion;

a stepped push rod piston including a large diameter piston portion at one end thereof sealingly, slidably mounted in said large diameter portion of said bore and a small diameter piston portion at an end opposite said large diameter portion thereof;

a stepped intermediate piston including a central large diameter piston portion sealingly, slidably mounted in said large diameter portion of said bore, a small diameter piston portion at one end thereof sealingly, slidably mounted in said small diameter portion of said bore defining a first working cylinder adapted to be connected to a first pair of wheel brakes, said small diameter piston portion and said large diameter piston portion of said intermediate piston and said bore defining a first annular fill chamber connected to a fluid resevoir said intermediate piston further including a coaxial tubular extension portion at an end opposite said small diameter piston portion thereof said small diameter piston portion of said push rod piston sealingly, slidably mounted in said tubular extension defining a second working cylinder, said tubular extension having a diameter less than said large diameter portions of said bore and being sealingly slidably mounted therein defining an annular chamber between said tubular extension and said large diameter portion of said bore, said annular chamber connected to said second working cylinder and adapted to be connected to a second pair of wheel brakes, said extension, said large diameter portion of said bore and said large diameter piston portion of said push rod piston defining a second annular fill chamber connected to said resevoir;

an axial passage in each of said push rod piston and said intermediate piston extending from a respective working cylinder through the small diameter piston portions thereof to a respective fill chamber;

valve means in each said passageway, each said valve means including a head portion of a guide pin having a washer thereon engaging a base of said passageway in each said piston;

means normally maintaining both valve means in an open position to provide communication between each said working cylinder and each said fill chamber, and acting between the opposite end of the head of said guide pin and a disc mounted at the base of each said small diameter piston portion head end; and

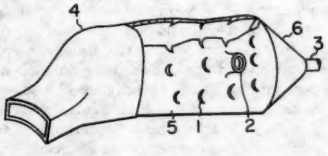
means for automatically closing the respective valve means on axial movement of the respective push rod and intermediate pistons, whereby said working cylinders are in communication only with the respective wheel brake circuits with the respective valve means in a closed condition.

4,621,499

GAS TURBINE COMBUSTOR

Takanobu Mori; Tetsuo Kashimura; Yutaka Fukui, all of Hitachi; Yoshimi Yanai, Kitaibaraki, and Nobuyuki Iizuka, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 528,148, Aug. 31, 1983, abandoned.
This application Jul. 11, 1985, Ser. No. 754,665
Claims priority, application Japan, Sep. 3, 1982, 57-152603
Int. Cl.[4] F02C 1/00; C22C 19/05
U.S. Cl. 60—752 5 Claims



1. A gas turbine combustor defining a combustion chamber

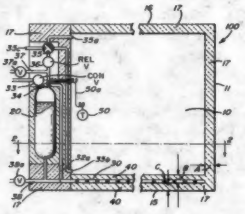
for comution of injected fuel and for introduction of the resultant hot combustion gas to nozzles of gas turbine, said combustor being cylindrical and being formed by shaping hot-worked alloy material into a desired shape by cold-working and welding of the material, wherein the parts of said combustor subjected to said hot combustion gas are made from an alloy material subjected to plastic working and having a composition consisting essentially of 0.02 to 0.2 wt % of C, not greater than 1 wt % of Si, not greater than 1.5 wt % of Mn, 18 to 26 wt % of Cr, 12 to 20 wt % of W, 20.5 to 31 wt % of Co, 0.1 to 1.2 wt % of Al, 0.5 to 1.9 wt % of Ti, 0.002 to 0.01 wt % of B, not greater than 0.5 wt % of a rare earth element selected from the group consisting of La and mischmetal, not greater than 5 wt % of Fe, not greater than 0.1 wt % of Mg, not greater than 0.5 wt % of Zr, not greater than 3 wt % of Nb and the balance not smaller than 20 wt % of Ni, and a fully austenite structure.

4,621,500

REFRIGERATION SYSTEM

R. F. Pagani; Kenneth J. Clarke, and Eric J. Avon, all of Pointe Claire, Canada, assignors to Conterm International Terminals, Inc., Pointe Claire, Canada

Filed Oct. 18, 1984, Ser. No. 662,375
Int. Cl.[4] F17C *1/00*
U.S. Cl. 62—45 **12 Claims**



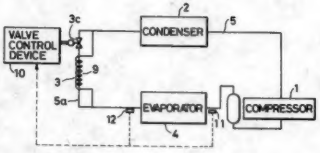
1. A chamber including an expandible refrigerant system associated therewith, said system comprising a reservoir containing an expandible refrigerant coolant, lead piping connecting said reservoir to a plurality of conduits carrying said coolant therein, said chamber comprising top, bottom and side walls, accordingly defining an interior and an exterior to the chamber, one of said walls comprises a door affording access into the chamber, each of said walls being insulated with insulating material, at least one of said walls comprising a first layer of said insulating material extending thereover adjacent said exterior, a second layer of said insulating material extending thereover adjacent said interior, said reservoir and said lead piping and plurality of conduits being disposed intermediate said first and second layers of insulating material thereby isolating them from both said interior and exterior, and whereby heat transferring through said at least one wall is substantially absorbed by said coolant and said insulating material cooled by said coolant, before it is able to penetrate through said at least one wall, permitting a product placed in said chamber to effectively maintain or substantially maintain a selected even temperature.

4,621,501

REFRIGERATION SYSTEM HAVING AUXILIARY COOLING FOR CONTROL OF COOLANT FLOW

Naoki Tanaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 407,407, Aug. 12, 1982, abandoned.
This application Apr. 30, 1984, Ser. No. 604,416
Claims priority, application Japan, Aug. 12, 1981, 56-127484; Aug. 12, 1981, 56-127485
Int. Cl.[4] F25B *5/00*
U.S. Cl. 62—199 **1 Claim**



1. In a refrigeration system of the type having a refrigeration circuit path in which a coolant passes, in order, through a compressor, a condenser, a pressure reducing means, an evaporator and back to said compressor for recirculation, the improvement comprising a branched coolant path having an inlet coupled to said refrigeration circuit path at a branching connection point for receiving a portion of said coolant from said refrigeration circuit path and an outlet coupled to said refrigeration circuit path at a reconnection point prior to the outlet of said evaporator at which said branched coolant after flowing through said branched coolant path is recombined with the remaining coolant in said refrigeration circuit path, said branched coolant path including branched pressure reducing means for reducing the pressure of said branched coolant to obtain lower temperature branched coolant and heat exchange means for subjecting said lower temperature branched coolant to heat exchange with the remaining coolant in a portion of said refrigeration circuit path, a valve control means for controlling the heat exchange rate of said branched coolant in response to a control signal and control means for generating said control signal provided to said valve control means, and wherein said heat exchange means comprises a central pipe having an inner wall with a spiral groove therein an insert within said central pipe and having a substantially smooth cylindrical outer surface cooperating with said spiral groove in said inner wall to form a spiral path comprising said pressure reducing means, and an outer pipe surrounding said inner pipe and carrying said lower temperature branched coolant.

4,621,502

ELECTRONIC TEMPERATURE CONTROL FOR REFRIGERATION SYSTEM

Fayez F. Ibrahim, and Kwok K. Fung, both of Niles, Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.

Filed Jan. 11, 1985, Ser. No. 690,606
Int. Cl.[4] F25B *41/04, 49/00*; G01K *13/00*
U.S. Cl. 62—223 **60 Claims**

1. A refrigeration system comprising:

A refrigerated display case with a primary air conduit having air inlet and outlet openings and an evaporator coil arranged therein for refrigerating air passing therethrough;

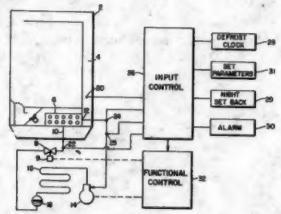
An expansion valve coupled to said evaporator coil for providing refrigerant thereto;

Electronic means for controlling the rate of refrigerant flow through said expansion valve;

A refrigeration control system including:

Temperature sensing means for sensing the temperature (T_{case}) of air that has passed over said evaporator coil; means for storing sensed time related temperature parame-

ters; means for setting preselected temperature control parameters including temperature differential limits and time related temperature parameters; means for comparing temperature T_{case} with said limits; electronic signals indicative of the flow rate of said valve; means for comparing the sensed temperature and the stored time related



temperature parameters with said set limits and set time related temperature parameters; and means for controlling the flow rate of said valve as a function of the differentials of T_{case} and said stored time related temperature parameters and set time related temperature parameters and the flow rate of said valve as indicated by said electronic signal.

4,621,503

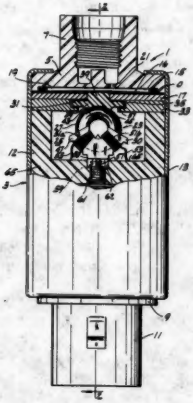
PRESSURE SENSING DEVICES AND METHODS, CONTROL DEVICES AND METHODS OF OPERATING SAME, SMART PRESSURE SWITCHES, AIR CONDITIONING SYSTEMS AND DEVICES FOR CONTROLLING SAME

Lee O. Woods; Ronald L. Hilty, both of Morrison, Ill., and William P. Kornrumpf, Albany, N.Y., assignors to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 596,818, Apr. 4, 1984, abandoned. This application Oct. 28, 1985, Ser. No. 791,805

Int. Cl.[4] F25B *1/00*; G01L *1/12*

U.S. Cl. 62—228.3 **53 Claims**



1. A device for sensing pressure at a source thereof comprising:

a housing with fluid pressure responsive means movable therein for defining therewith an expansible chamber means for communication with the pressure source; and

a transducer comprising a body of magnetoelastic material of generally annular form positioned within said housing and having magnetic properties which vary as a function of the stress to which said annular body is subjected, said annular body being stressed in response to movement of said fluid pressure responsive means, said transducer including means responsive to the stress-induced changes in the magnetic properties thereof for producing an electrical signal having a value which is a function of the magnitude of the fluid pressure, means for accepting and retaining a sector of said annular body and movable with said fluid pressure responsive means, a cradle arranged in said housing to accept and retain a generally diametrically opposite sector of said annular body so that an increase in the fluid pressure in said expansible chamber means tends to compress said annular body between said accepting and retaining means and said cradle, and said cradle having a portion thereof shaped to form a bobbin on which is wound at least one coil comprising said means for producing the electrical signal.

4,621,504

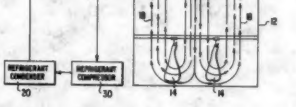
COOLING METHOD, SYSTEM AND APPARATUS FOR MINIMIZING DEHYDRATION OF FRESH MEAT PRODUCTS AND THE LIKE

Robert T. Tippmann, 9837 St. Joe Rd., Fort Wayne, Ind. 46815

Division of Ser. No. 727,681, Apr. 26, 1985. This application Jan. 21, 1986, Ser. No. 820,724

Int. Cl.[4] F25B *5/00*

U.S. Cl. 62—283 **10 Claims**



1. An air cooling apparatus comprising:

(a) a plurality of spirally wound, serially connected rows of refrigerant coils forming an evaporator having an open interior;

(b) means for supporting said coils in a stack;

(c) upper and lower flange means connected to said support means adjacent the ends of said stack around said hollow interior;

(d) diffuser means having a plurality of spaced-apart baffle means extending between said upper and lower flange means and parallel to each other, said baffle means being secured at the ends thereof to said upper and lower flange means, each of said baffle means extending from said coils to said interior and having a longitudinally extending lip adjacent one edge thereof to catch and divert entrained water blown from said coils;

(e) motor driven fan means having fan blades connected thereto for drawing air over said coils and between said baffle means; and

(f) pan means secured to said support means beneath said coils and said baffle means to collect water flowing therefrom for disposal.

4,621,505

FLOW-THROUGH SURGE RECEIVER

Roland A. Ares, St. Charles; James M. Cromer, Florissant; Wayne G. Schaeffer, Creve Coeur, and William C. Wehmeier, St. Charles, all of Mo., assignors to Hussmann Corporation, Bridgeton, Mo.

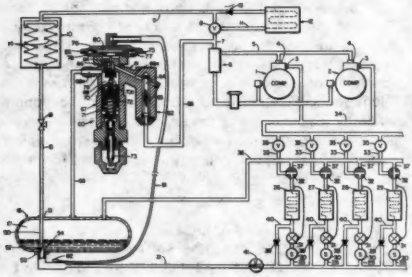
Filed Aug. 1, 1985, Ser. No. 761,426

Int. Cl.[4] F25B *39/04*

U.S. Cl. 62—509 **15 Claims**

1. A flow-through surge receiver for a refrigeration system

having compressor, condenser and evaporator means, said surge receiver comprising a receiver tank to form an internal reservoir for liquid refrigerant between said condenser and evaporator means, a flow-through refrigerant conduit for said receiver tank having an inlet end connected to the condenser means for receiving condensed subcooled liquid refrigerant



therefrom and an outlet end constructed and arranged to pass such condensed subcooled liquid refrigerant from said condenser means directly to the evaporator means without first passing through the internal reservoir, and said flow-through conduit including passageway means for establishing open fluid communication with said reservoir at a point below the normal level of liquid refrigerant therein.

4,621,506

KNITTING MACHINE

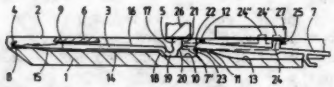
Louis Frund, Monthey, and Marcello Baseggio, Ollon, both of Switzerland, assignors to Atelier De Construction Steiger S.A., Switzerland

Filed Jan. 21, 1986, Ser. No. 820,699

Claims priority, application European Pat. Off., Jan. 29, 1985, 85200092.6

Int. Cl.[4] D04B *7/00, 15/66*

U.S. Cl. 66—75.1 **6 Claims**



1. A knitting machine comprising at least one needle bed having slidably mounted in its grooves a plurality of needles provided with at least one catch adapted to be positioned at two levels with respect to the top surface of the needle bed, namely one level whereat the catch can be driven by the cams of the cam holder, and another level whereat the catch is clear from the path of said cams, means for acting upon said catches so as to cause them to be set in positions corresponding to said two levels, respectively, one of said means consisting of a cam adapted to push said catches back to their lower level, and keys associated with each needles for moving said needles to their operative position, in which said needles can be driven by the working cams, wherein said needle bed grooves comprise a first dip registering with the major portion of the length of the needle in the inoperative position thereof, said first dip being followed by a second, deeper dip registering with the catch of the needle in the inoperative position thereof and connected through a ramp to said first dip, said needles comprising, beneath the needle catch and body, a bent portion interconnecting the catch and body of the needle, whereby, when the catch of an inoperative needle is pushed down to its lower level, the bend portion of the needle engages said second dip and, when the needle is pushed forwards by the key associated therewith, said bent portion abutes said ramp of the needle bed, thus causing the upward movement of said catch up to its upper level.

4,621,507

DISTRIBUTING DEVICE FOR SUSPENSIONS

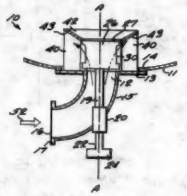
Weine Lundqvist, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Filed Apr. 1, 1985, Ser. No. 718,388

Claims priority, application Sweden, Apr. 2, 1984, 8401790

Int. Cl.[4] D06B *23/16*

U.S. Cl. 63—181 R **20 Claims**



1. Apparatus for distributing a suspension into a vessel having an inlet opening, with a given diameter, in a wall thereof, comprising:

a rotatable shaft having a first end extending into the vessel through said inlet opening;

a tubular skirt having first and second ends, an interior volume, and an inside diameter greater than said diameter of said inlet opening, and means defining at least one radial extending opening in said skirt;

connecting means for connecting said skirt to said shaft so that said skirt is substantially concentric with said shaft and rotatable therewith, said connecting means comprising a connecting component extending between said first end of said shaft and said first end of said skirt and mounting said skirt so that said second end thereof is adjacent and substantially concentric with said inlet opening, so that the interior volume of the tubular skirt is open except for said connecting component, and

baffle means stationarily mounted to said vessel adjacent and surrounding said inlet opening, for directing the flow of suspension introduced into the vessel through said tubular skirt, said baffle means comprising: a plurality of vanes disposed substantially concentrically with and surrounding said skirt, and extending generally radially outwardly from said skirt, each having a free end thereof spaced from the vessel wall; and an annular baffle connected to said vanes at said free ends thereof.

4,621,508

TEXTILE YARN CARRIER AND METHOD OF MANUFACTURING SAME

William H. Baxley, Jr., Hartsville, and Noah Y. Giles, Jr., Union, both of S.C., assignors to Sonoco Products Company, Hartsville, S.C.

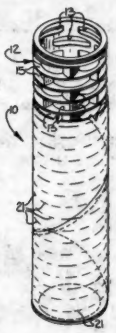
Filed May 13, 1985, Ser. No. 733,595

Int. Cl.[4] D06B *5/18;* **B65H** *75/22*

U.S. Cl. 68—198 **4 Claims**

1. A textile yarn carrier for use in dyeing or wet finishing the textile yarn and being characterized by an improved construction which alJows for economical material reclamation and usage and improved yarn delivery from the surface thereof; said yarn carrier consisting of only components of the same specific thermoplastic reclaimable material so that the entire yarn carrier can be ground-up and reused in constructing further yarn carriers of the same specific material; said components comprising a tubular core having passageways through the wall thereof for the passage of dye or other wet finishing baths, a filter sleeve means wound around the outside of said tubular core and having overlapping edges for receiving textile

yarn around the outside surface thereof and for preventing entrapment of the yarn in said passageways of said tubular core and for providing filtration of the dye or other wet finishing



baths, and ultrasonically formed means for sealing said sleeve means to said tubular core and to itself along said overlapping edges to eliminate obstacles to yarn delivery from said carrier.

4,621,509

COMBINATION LOCKING DEVICE HAVING REMOVABLE U-SHAPED RETAINING ROD

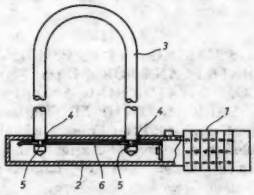
Toshinao Mizuno, Kasugai, Japan, assignor to Kabushiki Kaisha Saikousha, Kasugai, Japan

Filed Oct. 18, 1984, Ser. No. 662,159

Claims priority, application Japan, Oct. 20, 1983, 58-162537[U]

Int. Cl.⁴ E05B *37/02*

U.S. Cl. 70—26 **10 Claims**



1. A locking device comprising:

a combination lock comprising a plurality of number rings bearing numerals thereon, said number rings comprising means for unlocking said combination lock when they are moved to combine said numerals into a predetermined unlocking number;

a U-shaped retaining rod provided at both end portions thereof with retaining grooves;

a cylindrical body case mounted integrally with the combination lock, the cylindrical body case having retaining holes for insertion therein of both end portions of the retaining rod;

a retaining piece disposed in said body case and mounted for limited reciprocal longitudinal movement therein between a locking position within the body case and an unlocking position within the body case, said retaining piece comprising means for lockingly engaging and disengaging said grooves of the retaining rod when said retaining piece is in said locking and unlocking positions, respectively; and

means manually operable from the exterior of the body case for moving the retaining piece into the unlocking position.

4,621,510

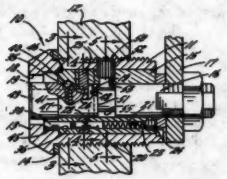
AXIAL PIN TUBULAR LOCK WITH IMPROVED PUNCH-OUT SECURITY

Frank J. Scherbing, Chicago, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Aug. 10, 1984, Ser. No. 639,593

Int. Cl.⁴ E05B *27/08*

U.S. Cl. 70—363 **6 Claims**



1. A tubular lock comprising an outer barrel having forward and rear ends, a stationary tumbler sleeve telescoped into the rear end portion of said barrel, a locking spindle extending through and rotatably mounted in said tumbler sleeve, a driver ring rotatable with said spindle and disposed within said barrel in face-to-face relation with the forward end of said tumbler sleeve, and axially extending and angularly spaced pins slidably mounted in holes in said tumbler sleeve and said driver ring and normally operable to prevent rotation of said spindle within said tumbler sleeve, said lock being characterized in that said spindle is formed with a reduced diameter portion positioned between the ends of said tumbler sleeve and defining a rearwardly facing shoulder, and a radially extending retainer having an outer end portion disposed in said barrel and tumbler sleeve and having an inner end portion disposed rearwardly of said shoulder, the inner end portion of said retainer leaving said spindle free for rotation but being engageable with said shoulder to prevent said spindle from being forcibly pushed rearwardly within said tumbler sleeve.

4,621,511

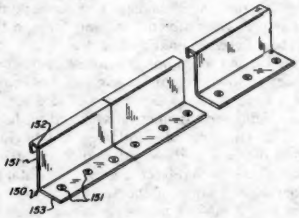
METHOD AND APPARATUS FOR FORMING LOOSELY CONNECTED ARTICLES

Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401

Filed Apr. 3, 1985, Ser. No. 719,513

Int. Cl.⁴ B21D *28/10*

U.S. Cl. 72—186 **15 Claims**



1. Apparatus for making a series of loosely connected articles from a strip of sheet material comprising:

a rotary shear having a set of shear drums each with a plurality of circumferentially spaced shear blades, each shear blade having a radially extending shearing face,

cooperating pairs of said shear blades moving successively to opposite positions with opposite shearing faces overlapping as said set of drums is rotated to form along the length of said strip a series of alined pairs of slits opening along opposite longitudinal edges of said strip with an intermediate scored portion between each pair of slits as

the strip is moved continuously between said set of rotary shear drums,

one of said shear blades having an intermediate transverse surface portion and oppositely extending outer transverse surface portions forming extensions of said intermediate transverse surface portion and the other of said shear blades has a straight transverse surface portion,

said outer transverse surface portions overlapping said straight transverse surface portion a distance greater than the thickness of the strip to provide offset opposite edges defining each slit that can be moved past one another when adjacent sections of the strip are bent about the associated intermediate scored portion to separate said sections by the application of twisting forces, and

said intermediate transverse surface portion overlapping said straight transverse surface portion less than the thickness of the strip to only partially shear and weaken said strip in forming said intermediate scored portion.

4,621,512

MECHANISM FOR AND METHOD OF SHIFTING CAM MECHANISMS IN A PRESS FOR PRESSING WORKPIECES WITH DEPRESSED PORTIONS

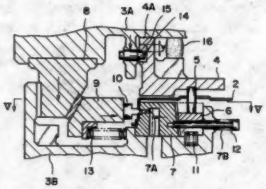
Shinziro Tachikawa; Chikao Hada, and Isami Maeda, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 28, 1983, Ser. No. 461,948

Claims priority, application Japan, Jan. 30, 1982, 57-12024[U]

Int. Cl.[4] B21D *28/22, 28/30*

U.S. Cl. 72—325 **8 Claims**



1. A shifting cam mechanism in a press for pressworking a workpiece having a depressed portion, comprising:

a pair of top and bottom forms, said top form being movable toward and away from said bottom form;

a die;

a first single cam mechanism disposed between said top and bottom forms for retracting said die from the workpiece, said first single cam mechanism being composed of a pad positioned downwardly of said top form, a lost-motion connection between said pad and said top form, a pin mounted on and extending downwardly from said pad, a first cam follower mounted on said bottom form and movable in response to depression of said pin, and a second cam follower mounted on said bottom form in abutment with said first cam follower and having said die mounted thereon, said second cam follower being movable in a direction to retract said die by a distance equal to the depressed portion of the workpiece when said first cam followr is moved on release of said pin;

a punch;

a resilient compressible support between said pad and said top form, said support being compressible upon movement of said forms towards each other to permit abutment of said top form against said pad while actuating said cam mechanism to move said die towards the workpiece; and

a second single cam mechanism disposed between said top and bottom forms for moving said punch to punch the depressed portion of the workpiece, said second single cam mechanism being composed of a fixed cam mounted on said top form, and a third cam follower mounted on said bottom form and supporting said punch, said third cam follower being in abutment with said fixed cam to move in response to depression of said fixed cam for enabling said punch to punch the depressed portion of the workpiece in coaction with said die on said second cam follower.

4,621,513

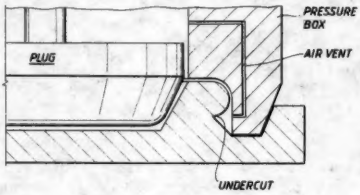
METHOD FOR MAKING A ROLLED LIP CONTAINER

John F. Bradford, Jr., Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1985, Ser. No. 792,090

Int. Cl.[4] B21D *28/00*

U.S. Cl. 72—334 **6 Claims**



1. A process for making a rigid packaging container which contains a "rolled lip" which comprises the steps of:

deforming a sheet of metal, plastic or paper composite material over a mold into a desired formed shape which contains a lip;

advancing a trimming means from the convex or bottom side of said shape while said shape is supported so that said shape does not deform; and

trimming said shape from said convex or said bottom side of said shape at a point on said lip of said shape which undercuts the periphery of said shape while, at the same time, forcing open the undercut of said lip of said shape.

4,621,514

METHOD OF MAKING AN INTERMEDIATE STAGE, INTERMEDIATE BLANK FOR A DYNAMO ELECTRIC MACHINE COMMUTATOR RING, AND APPARATUS TO CARRY OUT THE METHOD

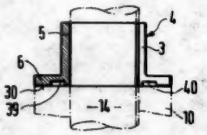
Fritz Dohmann, Paderborn; Peter Franz, Diekholzen; Friedrich Klaas, Altenbeken, and Günter Schulze, Klein Elbe, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1984, Ser. No. 650,348

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3333335

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—354 **20 Claims**



1. A multi-step process for the production of a commutator segmental ring, comprising the steps of:

making an unsegmented intermediate stage commutator ring (4) from a flat strip (1) of commutator metal by bending the flat strip (1) to form an essentially cylindrical tubular blank (2) having a gap or crack (3) adjacent the ends of the strip (1);

placing the thus-formed cylindrical tubular blank (2) in a forming press;

forming or flowing the metal of the essentially cylindrical tubular blank (2) in said forming press into a cylindrical portion (5) dimensioned for the intermediate stage commutator ring (4) and a flange portion (6) projecting laterally from the cylindrical portion,

said flowing or forming step including guiding the flowing or forming of the metal in an essentially axial direction to form a rectilinear groove, the center line of which groove coincides with said gap or crack (3) of the tubular blank, and

subsequently deforming said intermediate state ring (4) into a ring having segments defined by intersegmental gaps, said rectilinear groove falling wholly within one of the intersegmental gaps and not meandering into material forming any of said segments.

4,621,515

METHOD AND APPARATUS FOR MAKING CIRCLIPS

Albert M. Sanderson, Penkridge; Arthur Pearson, Halesowen, and David A. Bates, West Bromwich, all of England, assignors to George Salter & Co. Ltd., West Midlands, England

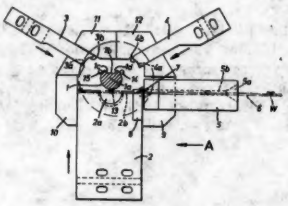
PCT No. PCT/GB83/00076, § 371 Date Nov. 10, 1983, § 102(e) Date Nov. 10, 1983, PCT Pub. No. WO83/03211, PCT Pub. Date Sep. 29, 1983

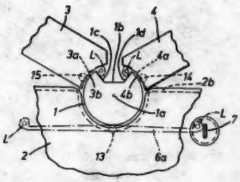
PCT Filed Mar. 14, 1983, Ser. No. 556,240

Claims priority, application United Kingdom, Mar. 12, 1982, 8207347.4; European Pat. Off., Mar. 9, 1983, 83301301

Int. Cl.[4] B21D *53/16*; B21F *37/00*

U.S. Cl. 72—403 **9 Claims**





1. A method of making circlips having a planar, generally annular ring section with a gap defining two free ends of the ring section, and a radially thick portion diametrically opposite the gap, the circlip diminishing in radial thickness from the radially thick portion toward the free ends to yield a smooth, continuous tapered appearance between the ends and said thick portion, said method comprising the steps of:

(a) making a longitudinal blank including a middle portion and two ends and being tapered from its middle portion toward its ends and having a shaped structural configuration to be formed into a said circlip by bending the blank,

(b) providing a mandrel around which the blank may be bent, and

(c) bending the blank accurately around its middle portion on said mandrel to distort the blank during the bending operation in a controlled manner to make said circlip with the ends of the blank being shaped into the ends of the circlip and the middle portion of the blank being shaped into the radially thick portion of the circlip.

6. Apparatus for making circlips having a planar, generally annular ring section with a gap defining two free ends of the ring section, and a radially thick portion diametrically opposite the gap, the circlip diminishing in radial thickness from the radially thick portion toward the free ends to yield a smooth, continuous tapered appearance between the ends and said thick portion, said apparatus comprising:

(a) means to make a longitudinal blank which is tapered from its middle portion toward its free ends,

(b) means to shape the blank so that it is capable of being bent into a said circlip,

(c) a mandrel and bending means adjacent to and co-operable with the mandrel,

(d) said bending means being advanceable toward the mandrel to accurately bend the longitudinal blank around the mandrel to distort the wire in a controlled manner into said circlip.

4,621,516

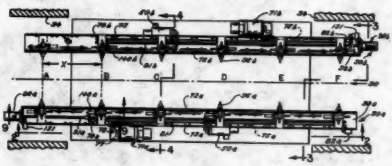
TRANSFER FEED PRESS WITH TRANSFER FEED SYSTEM

Thomas B. Schafer, Riverside; William Sindelar, deceased, late of Darien (by Dorothy Sindelar, legal representative), and Joseph R. Cummens, Elmhurst, all of Ill., assignors to Avondale Industries, Inc., New York, N.Y.

Continuation of Ser. No. 414,674, Sep. 3, 1982. This application May 2, 1985, Ser. No. 729,535

Int. Cl.[4] B21J *13/08*

U.S. Cl. 72—405 **2 Claims**



1. In a transfer feed press for performing a series of press operations on a workpiece at a series of work stations, a transfer feed system for moving a workpiece along a longitudinal direction through successive work stations comprising the combination of

a first and second transfer feed rail extending longitudinally along opposite sides of said series of work stations,

a row of finger units mounted on each of said transfer feed rails and spaced along said work stations for gripping said workpiece and moving the same between successive work stations in the press,

means mounting each row of said finger units for independently controllable movement relative to the transfer feed rail on which the finger units are mounted, along

(1) a longitudinal axis defining the direction of workpiece movement through the successive work stations of the press, and

(2) a transverse axis defining the direction of movement of the finger units in and out of engagement with the workpieces at the various work stations,

means mounting each of said transfer feed rails for independently controllable movement along a vertical axis defining the direction of vertical movement of said finger units for raising and lowering the workpieces at the various work stations of the press,

three separate electric servomotors for controlling movement of the first transfer feed rail and the row of finger units thereon along each of said longitudinal, transverse

and vertical axes, each of said servomotors being independently controllable by electric control signals,

three separate electric servomotors for controlling movement of the second transfer feed rail and the row of finger units thereon along each of said longitudinal, transverse and vertical axes, each of said servomotors being independently controllable by electrical control signals,

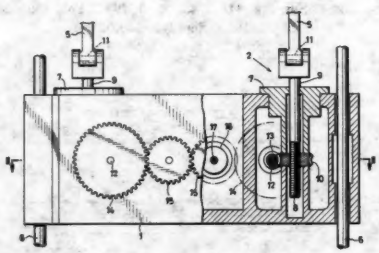
each of said transfer feed rails carrying the servomotors for controlling movement of the finger units mounted thereon along said transverse and longitudinal axes so that said units can be moved simultaneously along said vertical, transverse and longitudinal axes and each means mounting said transfer feed rails carrying in a stationary position an electric servomotor for controlling vertical movement of each transfer feed rail.

4,621,517

SYSTEM FOR AUTOMATICALLY CORRECTING POSITION OF SLIDE IN PRESS

Norio Hatanaka; Tsutae Hata; Yoshio Oketani, and Eiji Kimura, all of Fukui, Japan, assignors to Fukui Machinery Co. Ltd, Fukui, Japan

Filed Oct. 30, 1984, Ser. No. 666,540
Claims priority, application Japan, Jun. 1, 1984, 59-113487
Int. Cl.[4] B21J *7/46*
U.S. Cl. 72—441 **17 Claims**



1. A system for automatically correcting the position of a slide assembly relative to a bolster assembly of a press, comprising a position adjusting assembly mounted on one of said slide and bolster assemblies for adjusting the up-down relative position relationship between the slide assembly and a bolster assembly while the press is in operation, a distance detecting unit mounted on the other of said slide and bolster assemblies for detecting the relative distance between the bolster and the slide at the bottom dead center, and a control unit operatively connected to said position adjusting assembly and said distance detecting unit for controlling the position adjusting assembly based on the output of the distance detecting unit so that the relative distance between the bolster assembly and the slide assembly at the bottom dead center will be within a predetermined range during the operation of the press.

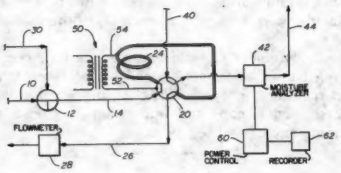
6. A system for automatically correcting the position of the slide of a press by sensing temperature of the drive assembly of the slide, comprising a position adjusting assembly mounted on said slide for adjusting the up-down relative position relationship between the slide and bolster, a temperature detecting unit mounted on said drive assembly for detecting the temperature of the drive assembly while the slide is at rest, and a control unit operatively connected to said position adjusting assembly and said temperature detecting unit for controlling the position adjusting assembly based on the output of the temperature detecting unit while the slide is at rest for positioning the top dead center of the slide within a predetermined range.

4,621,518

ANALYZER FOR WATER IN GASES BY ACCUMULATE-DESORB-INJECT METHOD

Walter F. Gerdes, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 21, 1985, Ser. No. 747,537
Int. Cl.[4] G01N *30/00*
U.S. Cl. 73—29 **9 Claims**



1. A method of measuring the moisture content of gas samples containing low levels of moisture, comprising the sequential steps of:

passing the gas sample through a column loosely packed with fibers for a predetermined period of time to selectively adsorb the moisture;

desorbing the moisture from said column with a carrier gas by rapidly heating said column; and

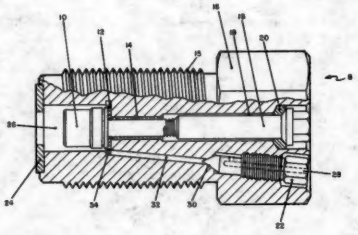
passing said carrier gas containing the desorbed moisture through a moisture analyzer.

4,621,519

BALLISTICS PRESSURE TRANSDUCER

Welton E. Phillips, Yuma, Ariz., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 29, 1984, Ser. No. 665,862
Int. Cl.[4] G01L *23/10, 23/28*
U.S. Cl. 73—35 **8 Claims**



1. A ballistics pressure transducer for use in gun tubes during the propellant ignition and burning process of ordnance projectiles comprising:

a. a pressure transducer body having a central bore mounted within the sidewall of a gun tube;

b. means for continuously sensing pressure within the gun tube, said means mounted within the central bore of said pressure transducer body;

c. means for shielding said sensing means from heat and propellant residue;

d. means for electrically insulting said sensing means from the gun tube;

e. a pressure chamber surrounding said means for continuously sensing pressure, said pressure chamber having an opening into the interior section of the gun tube;

f. a pressure seal to partially seal said opening of pressure chamber; and

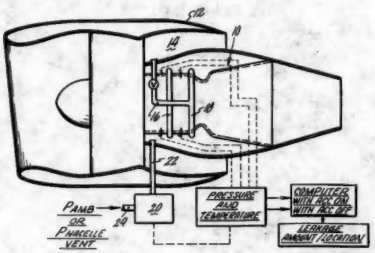
g. means for injecting high temperature grease into said pressure chamber.

4,621,520

LEAKAGE DETECTION AND TRACKING SYSTEM

Frederick M. Schwarz, and Barry L. Stoner, both of Glastonbury, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 26, 1984, Ser. No. 655,123
Int. Cl.[4] G01M 3/02
U.S. Cl. 73—40 4 Claims



3. The method of monitoring the air leakage from a nacelle housing a gas turbine power plant subjected to air leakage comprising the steps of

a. sensing the pressure within said nacelle in both the quiescence state and the state when a predetermined amount of air is ingested into the nacelle for generating a first signal and a second signal;

b. sensing the pressure outside the nacelle for generating a third signal;

c. calculating the ratio of the first and third signal and the ratio of the second and third signal for obtaining a fourth signal and a fifth signal;

d. generating a function relationship that is indicative of the isentropic flow characteristic of air by plotting a curve of the variables of

$$\frac{W\sqrt{T}}{A_p}$$

versus P_c, where W is air flow in pounds per second, T is temperature, A is the total leakage area and P is the pressure;

e. compute the flow parameters from the relationship between the air flowing into the nacelle and out of the nacelle from the isentropic flow curve obtained from the prior immediate step from the ratios calculated in the step of calculating for generating a sixth signal and seventh signal; and

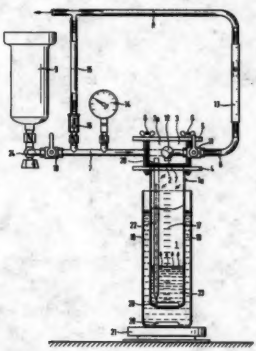
f. calculate the amount of leakage that is present in the nacelle by proportioning the sixth signal to the seventh signal.

4,621,521

APPARATUS FOR DETERMINING FOAM FORMATION OF CRUDE PETROLEUM

Horst Lattek; Hans-Ferdi Fink, and Götz Koerner, all of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,372
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 8405787[U]
Int. Cl.[4] G01N 33/28
U.S. Cl. 73—60.1 14 Claims



1. An apparatus for simulating the formation of foam during crude oil production, comprising a transparent cylindrical measuring vessel receiving a crude oil sample, said measuring vessel having a closed bottom and an open top, a circumferential radially extending flange having top and bottom sides formed at said open top, a ring-shaped member seated on said top side of and in coaxial relationship to said flange, said ring-shaped member defining a chamber in communication with said measuring vessel, a sealing plate placed on said ring-shaped member forming the top end of said chamber, clamping means for clamping said sealing plate against said ring-shaped member and said ring-shaped member against said top side of said flange in a gas-tight manner, a supply line for supplying liquid gas to be dissolved or distributed in the crude oil sample and a discharge line for the liquid evaporating under measurement conditions opening into said chamber, said supply line connected to a supply reservoir for said liquid, a metering valve for said liquid provided in said supply line, and control means for controlling the discharge velocity of said evaporating liquid in said discharge line.

4,621,522

METHOD OF DETERMINING THE MINIMUM LEVEL OF GAS ENRICHMENT FOR A MISCIBLE FLOOD

Richard L. Christiansen, and Hiemi Kim, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

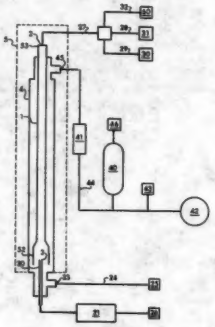
Continuation-in-part of Ser. No. 770,819, Aug. 28, 1985. This application Sep. 16, 1985, Ser. No. 776,725
Int. Cl.[4] G01N 15/00
U.S. Cl. 73—61 R 35 Claims

1. A method for determining the minimum level of enrichment required to render a substantially immiscible bulk gas miscible in a liquid hydrocarbon wherein a transparent tube contains a sample of said liquid hydrocarbon, the method comprising the steps of:

(a) maintaining said liquid hydrocarbon sample at a predetermined substantially constant temperature and pressure;

(b) forming a plurality of visible enriched gas bubbles comprised of said bulk gas and an enriching fluid, wherein the level of enrichment of said enriched gas is substantially below said minimum level of enrichment;

(c) sequentially discharging said plurality of gas bubbles into one end of said liquid sample contained in said tube;
(d) propelling said plurality of gas bubbles from said one end of said sample to the other end of said sample such that each gas bubble continuously and visibly contacts said liquid sample;
(e) visually observing said plurality of bubbles as it is propelled through said liquid sample;
(f) maintaining a fresh sample of said liquid hydrocarbon at said predetermined substantially constant temperature and pressure;
(g) forming a second plurality of visible enriched gas bubbles, having an incrementally higher level of enrichment



than said first plurality of enriched gas bubbles, and repeating steps c, d, and e for said second plurality of bubbles in said fresh sample of liquid hydrocarbon;
(h) repeating steps f and g, each time forming a plurality of enriched gas bubbles having an incrementally higher level of enrichment than said previous plurality of bubbles until at least one bubble of said plurality is observed to substantially dissipate into said liquid hydrocarbon sample at a given level of enrichment; and (i) determining said given level of enrichment at which said at least one bubble substantially dissipates in said liquid hydrocarbon sample to be said minimum level of enrichment required to render said bulk gas miscible in said liquid hydrocarbon.

4,621,523

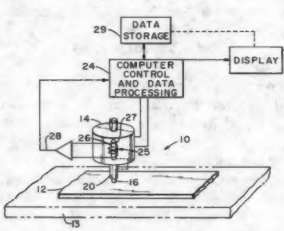
RAPID DETERMINATION OF METAL STRENGTH FROM HARDNESS TESTS

Barrie S. Shabel, Murrysville, and Robert F. Young, Allegheny Township, Allegheny County, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 544,735, Oct. 24, 1983, Pat. No. 4,530,235. This application Jun. 19, 1985, Ser. No. 746,321

Int. Cl.[4] G01N *3/48*

U.S. Cl. 73—81 **3 Claims**



1. Apparatus for making rapid determinations of yield and tensile strength of a metal workpiece from hardness evaluations of the workpiece, the apparatus comprising:
at least one indentor for making impressions in metal workpieces, said indentor having a known predetermined dimension,
means for directing the indentor against a metal workpiece at different known forces, the different forces being effective to form a series of impressions in the workpiece of different sizes,
means for characterizing the geometries of the impressions, and
means for utilizing the known forces, the known dimension of the indentor and the geometries of the impressions to calculate the yield and tensile strength of the workpiece.

4,621,524

CIRCUIT LAYOUT FOR THE SIMULATION OF MOMENTS OF INERTIA ON TEST STANDS

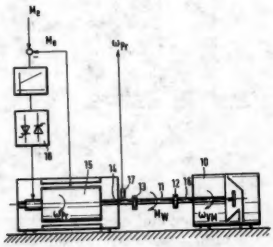
Hans-Jurgen von Thun, Hemsbach, Fed. Rep. of Germany, assignor to Brown, Boveri, and Cie A.G., Mannheim, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 730,644

Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416496

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—116 **17 Claims**



1. An apparatus for simulation of moments of inertia on a test stand comprising:
a test stand and a test specimen represented as an n-mass oscillator, wherein said masses are joined elastically with each other, said masses having spring constants C^{n-1} and attenuation measures d^{n-1};
means for electronic simulation of a system of additional m masses with spring constants and attenuations according to a differential equation system for a n+m mass system;
means for transmission of controlled torque to and n masses responsive to a torque set valve generated by said means for electronic simulation.

4,621,525

ACCELERATOR PEDAL ACTUATOR SYSTEM FOR AUTOMATIC DRIVING SYSTEM

Francis G. King, Bloomfield Hills, and Stewart V. Gable, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 682,454, Dec. 17, 1984, abandoned. This application Nov. 20, 1985, Ser. No. 800,098

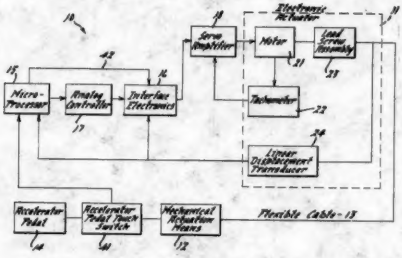
Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117 **7 Claims**

1. An automatic driver system for a vehicle with an engine associated with an accelerator pedal, and including an accelerator pedal actuator system having:
a force generating electronic actuation means mounted outside the vehicle, said electronic actuation means including a motor coupled to a tachometer for measuring rotational speed, a servo amplifier coupled to said motor and said

tachometer for receiving an input signal from said tachometer and applying an output driving signal to said motor thereby controlling the speed of said motor, a lead screw assembly, driven by rotational movement of said motor, for transforming rotational movement to linear movement, and a linear displacement transducer, coupled to said lead screw assembly, for measuring linear position of said lead screw assembly.

a force transmitting mechanical actuation means mounted in the vehicle for transmitting a force to contact and move the accelerator pedal, said mechanical actuation means including a mounting means whereby the height and angle



of an actuating force transmitted to the accelerator pedal can be adjusted;

a flexible cable coupling the electronic and mechanical actuation means for transmitting the forces from the electronic actuation means to the mechanical actuation means translating said forces to linear movement of the accelerator pedal, and said flexible cable being coupled to said mounting means of the mechanical actuation means and extending outside the vehicle to the lead screw assembly of electronic actuation means; and

a contact sensor means for sensing contact between said mechanical actuation means and the accelerator pedal.

4,621,526

CONTAINER HAVING A DEVICE FOR THE ELECTRIC MEASUREMENT OF THE LEVEL OF A LIQUID CONTAINED WITHIN IT

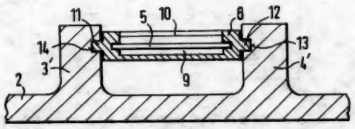
Bernhard Kant, Hochheim, and Hans-Georg Lauth, Schmitten, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,733

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322906

Int. Cl.⁴ G01F *23/24*

U.S. Cl. 73—304 R **23 Claims**



1. In a liquid container for motor vehicles having a device for the electric measurement of the level of a liquid contained therein, which device comprises a strip-shaped conductive foil suitable for connection to an electric measurement circuit having an indicator of liquid level, and adapted to be contacted by the liquid on both of its surfaces, the foil extending approximately from an upper region to a bottom of the liquid container, the improvement wherein

the container has a container side wall, and said device comprises

a holder for mounting said foil therein,

at least one holding means developed and projecting from said bottom and said side wall and extending along the entire extent of the foil and being directed to opposite edges of the foil for holding said holder and said conductive foil in communication with the inside of the container.

4,621,527

FLAT GLASS SIGHT GAUGE

Otto H. Varga, Bradford-on-Avon, and Montague A. Robbins, Backwell, both of England, assignors to Seetru Limited, Bristol, England

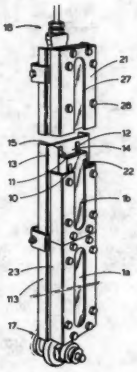
PCT No. PCT/GB84/00442, § 371 Date Jul. 11, 1985, § 102(e) Date Jul. 11, 1985, PCT Pub. No. WO85/02904, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 20, 1984, Ser. No. 756,988

Claims priority, application United Kingdom, Dec. 23, 1983, 8334305

Int. Cl.⁴ G01F *23/02*

U.S. Cl. 73—329 **16 Claims**



1. A flat glass sight gauge in which a plurality of sight glasses are aligned end to end to give the required length, said gauge including, in combination:

at least two elongate rectangular blocks of glass, each block having formed in one of its major faces a trough with a mouth which extends longitudinally of the major length of said face, but terminates short of the end of the block, so as to leave a flat surface on the said major face of the block surrounding the mouth of the trough of each glass block;

the base of each trough being formed with a plurality of longitudinally extending, parallel prismatic grooves;

metal backing plate means for mounting said glass blocks, said backing plate means having a flat frontal face and a reverse face with full length laterally spaced flanges;

an endless strip of sealing material being disposed on said flat surface surrounding the mouth of each trough;

said strip being sandwiched between the block and the flat frontal face of the backing plate means to which the block is clamped;

the said backing plate means being apertured to provide holes leading to the opposite ends of the troughs;

and wherein at least two adjacent blocks are secured end to end in alignment and including means for providing liquid intercommunication between the holes leading to adjacent ends of the two troughs of the said two adjacent blocks;

said means for providing liquid intercommunication comprising, for each junction between adjacent glass blocks, a metal connector block secured on and separable from the

reverse face of the backing plate means between the lateral flanges of said plate means;

the connector block having a duct communication between the holes in the backing plate means, each said hole communicating with an end of a said trough, and sealing means in the connector block surrounding the mouths of said holes; and

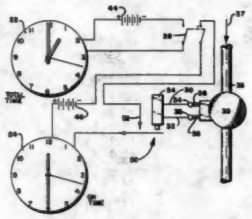
bolts securing the connector block to the reverse face of the backing plate means, which on being tightened, also impose pressure on the seals.

4,621,528

MONITOR APPARATUS AND METHOD OF DETERMINING APPLIANCE SIZE

Vernon J. Alt, Janesville, and Thomas J. Brogan, Rochester, both of Minn., assignors to The Third Hand, Inc., Elysian, Minn.

Filed Mar. 28, 1985, Ser. No. 716,833
Int. Cl.[4] G01K *1/08*
U.S. Cl. 73—432.1 **8 Claims**



1. An apparatus for monitoring an appliance, to determine proper appliance size with respect to energy output, the appliance having an on state wherein maximum energy output is provided and an off state wherein minimum energy output is provided, the apparatus comprising:

(a) a portable housing structure;

(b) first and second clock means supported by the housing structure for recording time, the first and second clock means each including indicator means observable from the outside of the housing structure for indicating the time recorded by the first and second clock means;

(c) power supply means electrically connected to the first and second clock means;

(d) switch means electrically connected to the first clock means and mounted on an outside of the housing, the switch means switchable at least between first and second positions for switching the first clock means between an on state and an off state, respectively, the first clock means recording time when in the on state; and

(e) relay means operatively interconnected to the switch means and operatively interconnectable to the appliance for switching the second clock means to an on state when the switch means is in the first position and the appliance is in the on state and for switching the second clock means to an off state when the appliance is in the off state, the second clock means recording time when it is in the on state.

4,621,529

MULTI-SENSOR PICKOFF ASSEMBLY

Roland Pittman, Montclair, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jun. 17, 1985, Ser. No. 745,055
Int. Cl.[4] G01P *9/02*
U.S. Cl. 73—504 **10 Claims**

1. A navigation sensor comprising:

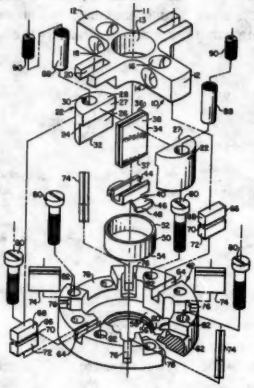
a gyroscopic element for rotation about a spin axis;

a torque sensing assembly, including:

(a) a first piezoelectric beam mounted in coaxial relation to the spin axis;

(b) first beam restraining means for mounting a first edge portion of the beam transverse to the spin axis and within the gyroscopic element;

(c) second beam restraining means for mounting an opposite edge portion of the beam transverse to the spin axis and within the gyroscopic element;



(d) keeper means for mounting the beam to a base,

wherein the resulting restrained beam of the torque sensing assembly generates an electrical signal proportional to the angular velocity of the navigation sensor about an axis perpendicular to the spin axis; and

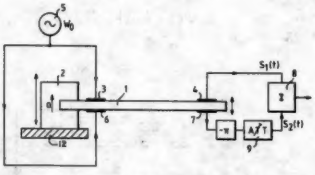
at least one flexure hinge for resiliently mounting the gyroscopic element to the base.

4,621,530

SURFACE ACOUSTIC WAVE ACCELEROMETER

Douglas F. G. Dwyer, Bishops Stortford, and David E. Bower, London, both, England, assignors to Standard Telephones and Cables Public Limited Company, London, England

Filed Jul. 13, 1984, Ser. No. 630,672
Claims priority, application United Kingdom, Jul. 14, 1983, 8319103
Int. Cl.[4] G01P *15/09*
U.S. Cl. 73—517 R **14 Claims**



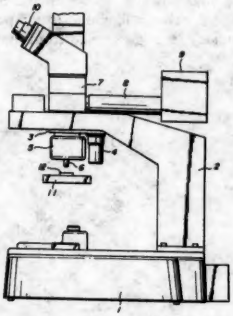
1. A differential SAW accelerometer comprising a resilient beam, the beam being secured in a mount so that movement of the mount results in inertial bending of the beam, a pair of SAW devices, one on either side of the beam, the SAW devices being operated in a differential mode and having outputs that are in antiphase and are balanced in amplitude under conditions of zero acceleration, means for setting the beam into a mechanical flexural oscillation which is superposed on the movement of the beam due to acceleration forces, and means for combining the outputs of the SAW devices to produce a resultant output indicative of acceleration.

4,621,531

ULTRASONIC MICROSCOPE

Yuzo Nakamura; Soji Yamamoto; Mitsugu Sakai, and Fumio Uchino, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,428
Claims priority, application Japan, Nov. 2, 1983, 58-204722
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—606 6 Claims



1. An ultrasonic microscope for observing an ultrasonic raster image of a specimen on a monitor by scanning the specimen by vibrating an ultrasonic head in the X direction by a vibrator and by moving a specimen stage in the Y direction on which the specimen is placed, and for observing an optical image of the sample by means of a light source, an eyepiece, and an optical head including an objective lens, comprising:

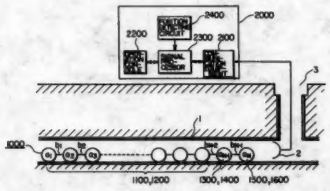
a slide plate on which are arranged said ultrasonic head and said objective lens which are separated by a predetermined spacing in the Y direction, said slide plate being slidable in the Y direction by a distance substantially equal to said predetermined spacing so as to make substantially identical said ultrasonic raster image with said optical image.

4,621,532

CHAIN-LIKE SELF-MOVING ROBOT AND CONTROL SYSTEM THEREFOR

Atsushi Takagi, Tokyo; Shigeru Izumi, Hitachi; Fuminobu Takahashi, Katsuta; Chikara Sato, Hitachi; Shinji Naitoh, Hitachi, and Shinji Sonoda, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Tokyo Gas Co., Ltd., both of Tokyo, Japan

Filed May 15, 1985, Ser. No. 734,047
Claims priority, application Japan, May 18, 1984, 59-98667
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—623 37 Claims



1. A chain-like self-moving robot crawling on an object, comprising:

at least three capsule units;

coupling means for interconnecting said capsule units serially in a chain-like manner;

a plurality of expanding and contracting means each provided between said coupling means and said capsule unit and capable of being in an expanding state and a contracting state, for stretching and diminishing a space between said interconnected capsules by expanding and contracting only in a direction of movement of said robot; and

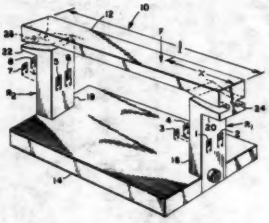
control means for controlling the expanding and contracting means in a predetermined sequence on the basis of predetermined expansion/contraction control signals, said predetermined sequence being such that a changing operation between the expanding state and contracting state is propagated through said plurality of expanding and contracting means in said direction of movement of said robot to provide a motion with less than a half of said capsule units being moved while the remaining capsule units are held stationary is repeated sequentially to move said robot as a whole.

4,621,533

TACTILE LOAD SENSING TRANSDUCER

Sherif S. Gindy, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 19, 1984, Ser. No. 672,544
Int. Cl.[4] G01L *5/16*
U.S. Cl. 73—862.04 12 Claims



1. A tactile load sensing transducer comprising:

(a) a base member having a plurality of load cells mounted thereon in spaced apart relationship;

(b) a resiliently bendable member substantially simply supported by said load cells disposed at spaced apart margins of said bendable member;

(c) means defining a loading surface on said bendable member at any point intermediate the said load cells;

(d) circuit means operable to sum the signal outputs of said load cells to provide a continuous signal indicative of the total load on said bendable member and including means operable to determine the proportion of the total load on each load cell for providing indication of the location of said load along said bendable member.

4,621,534

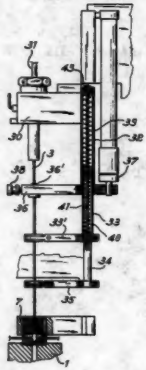
AUTOMATIC SAMPLE APPARATUS, VALVE AND SAMPLING METHOD

Fausto Munari, Milan; Bruno Tosi, Verano Brianza, both of Italy; Sorin Trestianu, Brussels, Belgium, and Enzo Montagner, Pioltello, Italy, assignors to Carlo Erba Strumentazione S.p.A., Italy

Filed Sep. 6, 1984, Ser. No. 647,986
Claims priority, application Italy, Sep. 14, 1983, 22978/83[U]; Jun. 22, 1984, 21557 A/84; Jun. 29, 1984, 22433/84[U]
Int. Cl.[4] G01N *1/00*
U.S. Cl. 73—864.86 23 Claims

1. An automatic sampling apparatus for the injection of samples to be analyzed in a gas chromatographic capillary column, said sampling apparatus having operably associated therewith an automatic device for feeding individual samples to be analyzed and a washing fluid to an injection syringe to be

inserted into said capillary column, said sampling apparatus comprising an injection sryinge operatively associated with said automatic device, a housing containing said capillary column, an injector of the non-vaporizing direct on-column type secured to said housing, said injector having a first axial bore extending therethrough in fluid communication with said capillary column, a switch valve sealingly secured to said injector and having a second axial bore extending therethrough for receiving a portion of said injection syringe and arranged in coaxial alignment with said first axial bore of said injector, actuating means for reciprocally advancing and withdrawing said injection syringe between said first and second axial bores of said injector and said switch valve, said actuating means including a first arm adapted for reciprocal movement along a linear path for advancing and withdrawing said injection syringe and having said injection syringe secured thereto, a second arm spaced from said first arm and having an opening slidingly receiving said injection syringe, and a third arm spaced from said second arm, and having an opening slidingly



receiving said injection syringe, said openings of said second and third arms being arranged along said linear path, whereby said injection syringe is guided along said linear path by said openings in said second and third arms, a first sealing septum separating said first and second axial bores, a second sealing septum provided within said second axial bore and spaced from said first sealing septum to define a first chamber therebetween, a second chamber having a diameter greater than that of said first chamber arranged within said switch valve adjacent said first sealing septum and in fluid communication with said first chamber, and first, second and third ducts provided within said switch valve, said first duct arranged intermediate of said first and second sealing septums in fluid communication between said first chamber and an external exhaust, said second duct arranged adjacent said second chamber in fluid communication therewith and a source of a gas under pressure, and said third duct arranged adjacent said second sealing septum in fluid communication between said first chamber and an external exhaust.

4,621,535

FORWARD ENGAGEMENT AND REVERSE DISENGAGEMENT DEVICE

Bruce A. Bronson, and Brian C. Preston, both of Anaheim, Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

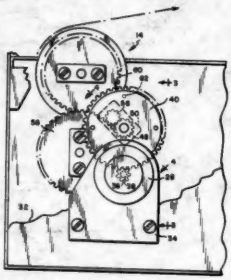
Filed Jul. 19, 1985, Ser. No. 756,547
Int. Cl.[4] F16H *57/00, 35/00*
U.S. Cl. 74—405 **6 Claims**

1. A drive mechanism adapted for application of a drive torque thereto to drive a web forward in response to application of torque in one direction but permit relatively free movement of the web in response to application of torque in the other direction, the mechanism comprising:

A. a chassis;

B. a drive roll, rotatably mounted on the chassis and adapted for engagement by a web, for rotating to drive any web engaging the roll;

C. a pivot arm having a planetary gear rotatably mounted thereon for rotation about a planetary-gear axis, the pivot arm being pivotably mounted to the chassis for pivoting, about a pivot axis spaced from the planetary-gear axis, between a first position, in which the planetary gear is coupled to the drive roll, and a second position, in which the planetary gear is decoupled from the drive roll;



D. a sun gear adapted for driving by a power source, the sun gear being rotatably mounted for rotation about the pivot axis and driving engagement of the planetary gear to drive the planetary gear when driven by the power source; and

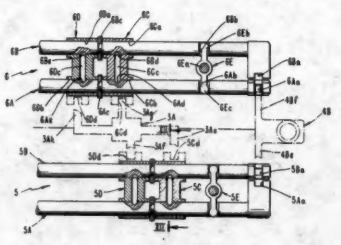
E. a unidirectional clutch operatively connected between the pivot arm and the sun gear for coupling the pivot arm to the sun gear when the sun gear rotates in a first direction, in which engagement tends to pivot the pivot arm toward the second position, but for decoupling the sun gear from the pivot arm when the sun gear rotates in the other, second, direction, whereby the power source can drive the drive roll, without drag from the pivot arm, by operating in one direction but can be disengaged from the drive roll by operating in the other direction.

4,621,536

ACTUATING MECHANISM FOR GEAR TRANSMISSIONS

Kenji Takeuchi, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 28, 1984, Ser. No. 675,753
Claims priority, application Japan, Dec. 16, 1983, 58-238091
Int. Cl.[4] G05G *9/12*
U.S. Cl. 74—473 R **7 Claims**



1. A gear transmission mechanism including main transmission gearing and auxiliary transmission gearing directly coupled therewith, wherein said main transmission gearing trans-

mits the movement of a shift lever in a shift direction through a shift mechanism and a fork head to a sleeve, said auxiliary transmission gearing being capable of selecting a high or low speed ratio in response to transmission of the movement of the shift lever to another sleeve when said shift lever is shifted from a neutral position in one shift direction or the other, said shift mechanism comprising an input member, a reversing mechanism, a reversing member, and a pair of shift heads, said input member coacting with said shift lever such that the movement of said shift lever in said shift direction results in the movement of said input member in a shift direction, said reversing mechanism being interposed between said input member and said reversing member for reversing the movement of said input member in said shift direction into movement in an opposite shift direction and for transmitting the reversed movement to said reversing member, one of said shift heads being shiftable from the neutral position into one shift position, selectively engageable with one of said input and reversing members which moves from said neutral position to said one shift position, and movable in said one shift direction, the other shift head being shiftable from the neutral position into an opposite shift position, selectively engageable with one of said input and reversing members which moves from said neutral position to said opposite shift position, and movable in said opposite shift direction, said fork head being interposed between said one and other shift heads and movable in a select direction in coaction with said shift lever moving in said select direction, said sleeve being engageable alternatively with said one or other shift head through said fork head in response to positioning of said fork head in said select direction.

4,621,537

GEAR SELECTION AND ENGAGEMENT DEVICE FOR A MOTOR VEHICLE TRANSMISSION

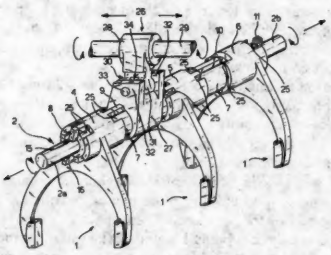
Romano Piazza, Brescia, and Armando Gregori, Breno, both of Italy, assignors to Iveco Fiat S.p.A., Turin, Italy

Filed Jun. 15, 1984, Ser. No. 621,042

Claims priority, application Italy, Jun. 17, 1983, 67675 A/83

Int. Cl.[4] G05G *5/08, 9/12*

U.S. Cl. 74—477 **8 Claims**



1. A gear selection and engagement device for pairing axially movable gears with axially fixed gears in a motor vehicle transmission so as to form a gear pair having a predetermined transmission ratio, comprising:

(a) a transmission case;

(b) a shaft displaceably and rotatably mounted in said transmission case,

(c) a manually operable control means connected to said shaft for controllably displacing said shaft along and rotating said shaft about a longitudinal axis;

(d) a plurality of sleeve-like hubs rotatably and axially displaceably mounted on said shaft, each of said hubs having a bore surface, an outer circumferential surface and a pair of opposing end surfaces, and having a pair of control forks integrally connected thereto;

(e) a first set of teeth projecting radially from said shaft in an axially spaced relationship such that each of said hubs is arranged between two adjacent teeth of said first set, said first set of teeth being axially and circumferentially fixed relative to said shaft; and

(f) a second set of teeth projecting radially from said shaft in an axially spaced relationship such that each of said hubs is arranged between two adjacent teeth of said second set, said second set of teeth being axially slidable and circumferentially fixed relative to said shaft and axially fixed relative to said transmission case,

wherein each of said hubs has at least one pair of grooves extending axially from respective endfaces of said respective hub, each of said grooves extending axially from a respective one of said opposing end surfaces along part of the axial extent of said respective hub, extending radially from said bore surface to said outer circumferential surface of said respective hub, and being formed to receive a corresponding one of said teeth, said grooves being arranged at predetermined positions along the circumference of each hub such that when one of said grooves of one of said hubs is aligned with a corresponding one of said second set of teeth in response to rotation of said shaft, one of said grooves of each hub other than said one hub is aligned with a corresponding one of said first set of teeth.

4,621,538

FOOT-OPERATED PARKING BRAKE

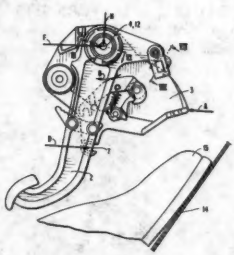
Ernst Senft, Möglingen; Hans Hirth, Würzburg, and Herbert Klemmer, Nürtingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 5, 1985, Ser. No. 720,184

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413030

Int. Cl.[4] G05G *1/14*

U.S. Cl. 74—512 **4 Claims**



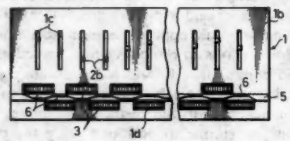
1. A lockable and releasable pedal arrangement for a foot-operated parking brake of a motor vehicle fastened to a cowl column in the driver's foot space in the junction region of a dashboard cowl, characterized in that the pedal arrangement is pivotably mounted on a baseplate which is fastened to the vehicle at three points and out of a driver's foot space under the effect of a rearward deformation of the cowl as the result of an accident and wherein the baseplate is frictionally mounted at the pivot axis of the pedal to a component integral with the vehicle in such a way that the pedal and baseplate pivot against a frictional force acting between the baseplate and the component integral with the vehicle.

4,621,539

DEVICE HAVING ROTARY KNOBS EXTENDING PARTIALLY THROUGH A PLATE MEMBER

Tsuyoshi Aoki, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Division of Ser. No. 278,469, Jun. 29, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 763,084
Claims priority, application Japan, Jul. 1, 1980, 55-92136
Int. Cl.[4] G05G 1/10
U.S. Cl. 74—553 5 Claims



1. In a structure having a plurality of rotary knobs extending partially through respective slots in a plate member for operator manipulation with a finger, each rotary knob being adapted to operate a respective electric component,

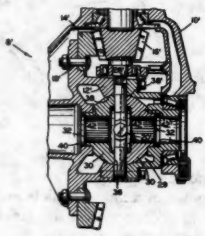
the improvement wherein the plurality of rotary knobs are arranged in at least two parallel rows spaced closely adjacent each other, the rotary knobs in each row being spaced apart from each other and aligned parallel in one plane, the rotary knobs of one row being staggered so as to be laterally offset with respect to the rotary knobs of the other row, and further comprising a raised, continuous barrier in the form of a bar between the two rows extending lengthwise linearly coextensively with the two rows at least from the first rotary knob beginning each respective row to the last rotary knob of each respective row and extending upright from the plate member to a height sufficient to prevent accidental actuation of a rotary knob in one row during actuation of rotary knob in the other row, said bar having respective sides each said side facing a respective said row and, each said side having a plurality of recesses formed therein each corresponding to and facing a rotary knob of the respective row for accomodating the finger of the operator therein during actuation of a rotary knob.

4,621,540

AXLE LOCKING DIFFERENTIAL DEVICE

Kent E. Davison, Columbia City, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Apr. 16, 1984, Ser. No. 600,861
Int. Cl.[4] F16H 1/44
U.S. Cl. 74—710.5 8 Claims



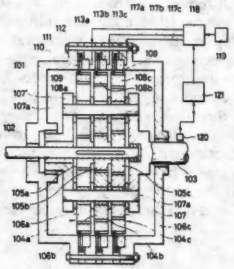
1. In a differential case having interior walls including a plurality of cross support bores, a unitary cross member having an arcuate periphery positively engaging said support bores; an improvement comprising a unitary differential locking device supported by a plurality of pilot means, said pilot means engaging said cross member and said interior walls in three orthogonal planes, wherein said pilot means engaging said cross member comprises a pair of opposed cradles integrally formed within said locking device each having a bearing surface defined by an open-ended half-cylinder, wherein each surface directly engages one half of the arcuate periphery of said cross member whereby each of said cradles envelops 180 degrees of said periphery.

4,621,541

APPARATUS FOR CHANGING ROTATIONAL SPEED WITH THE AID OF CLUTCHING ACTIVITY

Takashi Takahashi, 26-18, Kamisoshigaya 1, Setagaya-ku, Tokyo 157, Japan

Filed Jun. 5, 1984, Ser. No. 617,464
Claims priority, application Japan, Aug. 4, 1983, 58-141841
Int. Cl.[4] F16H 57/10, 3/44
U.S. Cl. 74—786 4 Claims



1. An apparatus for changing rotational speed with the aid of clutching activity essentially comprising:

a plurality of planetary gearing mechanisms each having a different speed changing ratio and being arranged in series in an axial direction of said apparatus to define a multistage structure,

each of said gearing mechanisms including a sun gear, a plurality of planet gears, and an inner ring gear,

the sun gears of said gearing mechanisms being supported on a common shaft, and the planet gears of said gearing mechanisms being supported in alignment on axially extending common shafts;

said gearing mechanisms being disposed in a casing between an input shaft and an output shaft with said inner ring gears being rotatably incorporated therein, said inner ring gears being rotatably supported entirely free from both of the input and output shafts;

each of said gearing mechanisms having associated therewith ring-shaped braking plate means comprising an opposing pair of frictional plates, a respective one of each of said pairs of plates being located at the outer periphery of a respective one of said inner ring gears to rotate together therewith, and a respective other one of each of said pairs of plates being axially displaceably fitted into the inner periphery of the casing, said respective one of each of said pairs of plates being located opposite to said respective other one of each of said pairs of frictional plates; and

ring-shaped bellows disposed radially outwardly of said plurality of planetary gearing mechanisms and being provided for each stage of said multistage structure, each of said bellows being made of a steel plate having a thin thickness, each of said bellows being located opposite to one of said braking plate means and being adapted to selectively receive pressurized fluid therein so that said bellows will expand in the axial direction when pressurized fluid is filled therein and contract in the axial direction when it is discharged therefrom, whereby at least a selected one of said ring-shaped bellows is adapted to exert a thrust on a respectively associated braking plate

means to brake the respectively associated inner ring gear when said one selected bellows is caused to expand,

whereby said multi-stage structure, when said pressurized fluid actuates one or more of said ring-shaped bellows, operates as a multi-stage speed changing apparatus.

4,621,542

SPEED CHANGE CONTROL DEVICE FOR CONTINUOUSLY VARIABLE TRANSMISSION

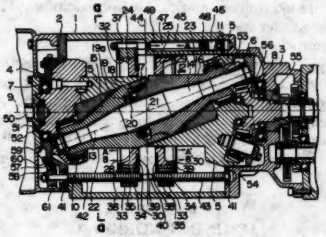
Toshihiko Asano, and Tatsuaki Takigawa, both of Nagano, Japan, assignors to Ishikawajima-Shibaura Machinery Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1984, Ser. No. 673,342

Claims priority, application Japan, Jun. 13, 1984, 59-121258

Int. Cl.[4] F16H *15/50, 15/16*

U.S. Cl. 74—796 **5 Claims**



1. A speed change control device for a continuously variable transmission, comprising:

a carrier adapted to rotate about a predetermined axis,

a twin cone held by said carrier by means permitting said twin cone to rotate integrally with said carrier about said predetermined axis and to rotate about a central axis which is inclined with respect to said predetermined axis,

a pair of track rings disposed around the outer periphery of said carrier and mounted for movement along said predetermined axis, a part of the inner peripheral surface of each said track ring being in frictional engagement with the outer peripheral surface of said twin cone, and

means for moving said track rings and maintaining said track rings in symmetric positions with respect to a point of intersection of said predetermined axis and said central axis, said means for moving and maintaining comprising:

(a) a screw shaft having an axis parallel to said predetermined axis and mounted for rotation about said axis thereof, said screw shaft having left-hand threads of a large lead angle on one half thereof and right-hand threads of a large lead angle on the other half thereof, the left-hand thread portion of said screw shaft being in threaded engagement with one said track ring and the right-hand thread portion of said screw shaft being in threaded engagement with the other track ring, and

(b) a hydraulic cylinder having a rod adapted to slide in parallel with said predetermined axis, a fore end portion of said rod being directly connected to only one of said track rings, whereby said one of said track rings is moved by said rod and said other track ring is moved by said screw shaft.

4,621,543

PLANETARY TORQUE CONVERTER

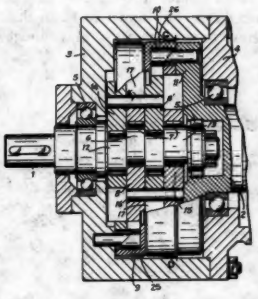
Francisco Legorburu, Gabilondo, Guipuzcoa, Spain, assignor to Goizper S. Coop., Guipuzcoa, Spain

Filed Mar. 19, 1984, Ser. No. 590,859

Claims priority, application Japan, Jul. 26, 1982, 57-128878; Mar. 6, 1984, 277971

Int. Cl.[4] F16H *1/32, 1/28*

U.S. Cl. 74—805 **4 Claims**



1. In a double reduction torque converter of the type having:

a pair of first drive planets interconnected by gudgeon pins for movement in unison with each other, and respectively reacting against a fixed casing of the converter and a rotatable carrier fast with an output shaft of the converter, and,

a pair of second drive planets interconnected with each other by gudgeon pins for movement in unison with each other, said second drive planets being angularly displaced from said first drive planets and also reacting respectively against said fixed casing of said converter and a rotatable carrier fast with said output shaft of the converter,

each of said first and second drive planets being mounted on eccentrics fast with an input shaft:

the improvement comprising:

one of said second drive planets being positioned axially intermediate said first drive planets;

one of said first drive planets being positioned axially intermediate said second drive planets;

said gudgeon pins extending through apertures in said axially intermediate drive planets;

whereby the axial length of said gudgeon pins respectively interconnecting said first drive planets and said second drive planets is reduced to the distance between the outer surfaces of said first and second drive planets.

4,621,544

ADJUSTABLE FULLY AUTOMATIC VACUUM MODULATOR CONTROL FOR AUTOMATIC TRANSMISSION HAVING A VACUUM MODULATOR

Ronald Re, Newark, Del., assignor to Tran-Saver, Inc., Cleveland, Ohio

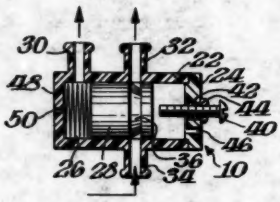
Filed Jun. 28, 1984, Ser. No. 625,701

Int. Cl.[4] B60K *41/04*

U.S. Cl. 74—863 **6 Claims**

1. In a multispeed automatic transmission system for vehicles having transmission gears which shift from low to high to low in response to the acceleration and deceleration of the vehicle wherein a vacuum modulator control is mounted in the vacuum line between the vacuum modulator and the intake manifold, the improvement being said vacuum modulator control adapted for mounting at any desired location in the engine compartment comprising a cylinder, a piston slidably positioned in said cylinder, said cylinder having a front end face and a rear end face and a peripheral surface, resilient means in

said cylinder for urging said piston toward one of said end faces, stop means in said cylinder remote from said resilient means limiting the amount of movement of said piston in said cylinder, a first port communicating with the interior of said cylinder through said peripheral surface, said first port communicating with the vacuum modulator, second and third ports communicating with the interior of said cylinder through said peripheral surface, said second and third ports communicating with the intake manifold whereby during deceleration air flows into said cylinder through said first port and exits from said cylinder through said second and third ports with said piston being urged against said resilient means and



whereby during acceleration air flows into said cylinder through said second and third ports and exits form said first port with said piston being urged away from said resilient means, said piston including a peripheral groove creating flow communication between said first and second ports, and said first and second and third ports and said piston and said peripheral groove being spaced and dimensioned with respect to each other and with respect to said stop means whereby said first and second ports are always in flow communication with each other and open ranging from a fully open to a bleed condition regardless of the position of said piston and said third port is always open regardless of the position of said piston.

4,621,545

METHOD AND APPARATUS FOR CONTROLLING AN AUTOMOTIVE DRIVE SYSTEM WITH FREE-WHEELING

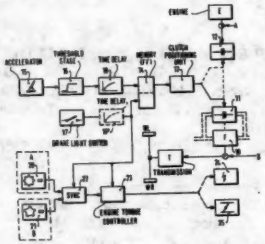
Helmut Mohl, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 424,251, Sep. 27, 1982, abandoned. This application Mar. 8, 1985, Ser. No. 709,361

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3204002

Int. Cl.[4] B60K *41/06*

U.S. Cl. 74—866 **18 Claims**



1. In an automotive vehicle, an automotive drive system having a drive train including

an engine (E) and free-wheeling means (**10, 11, 12**) for interrupting positive drive connection between the engine and a gear transmission (T) to permit free-wheeling operation of the vehicle;

vehicle acceleration signal generating means (**15, 16**) for generating a vehicle acceleration signal;

vehicle retardation signal generating means (**17**) for generating a vehicle retardation signal;

free-wheeling control means (**13, 14**) operatively connected to said free-wheeling means (**10, 12**), responsive to said vehicle acceleration signal and to said vehicle retardation signal, respectively.

(a) for enabling the free-wheeling means in the drive train of the vehicle, in response to a vehicle acceleration signal, and

(b) disabling the free-wheeling means in the drive train of the vehicle and reestablishing positive drive connection between the engine and the transmission of the vehicle in response to a vehicle retardation signal generated by said vehicle retardation signal generating means;

engine torque control means (**23**) controlling output torque of the engine;

engine output speed sensing means (**20**) providing an engine speed signal;

transmission speed sensing means (**21**) providing a transmission speed signal,

means (**22**) for sensing a predetermined relationship of the engine speed signal and the transmission speed signal to determine when the engine speed, represented by said engine speed signal, approaches the transmission speed, represented by the transmission speed signal and resulting in a predetermined relationship approaching synchronism between said speeds,

and wherein

the engine torque control means (**23**) are connected to and controlled by the vehicle retardation signal generating means (**17**) and operative for controlling torque output of the engine to reduce engine torque during disabling of the free-wheeling means to provide for "soft" transition from free-wheeling to positive drive of the drive train.

4,621,546

MACHINING WORKPIECES

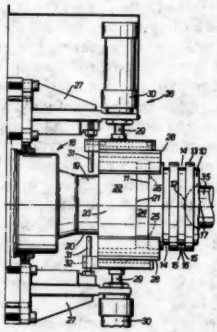
William C. Morrison, Kenilworth, England, assignor to AE PLC, Warwickshire, England

Filed Feb. 20, 1985, Ser. No. 703,298

Claims priority, application United Kingdom, Feb. 20, 1984, 8404453

Int. Cl.[4] B23B *1/00, 25/06*

U.S. Cl. 82—1 C **2 Claims**



1. A device for setting up and holding a piston on a machining axis to allow machining of an outer surface thereof in a single operation, comprising:

a rotatable headstock assembly defining a machining axis,

a mandrel included in the headstock assembly,

a cylindrical outer surface provided on the mandrel coaxial with said machining axis,

an annulus removably mounted on said cylindrical outer surface of said mandrel,

a datum cylindrical surface formed on said annulus coaxial with said machining axis and having a diameter which is the same as the diameter of a piston to be machined,

an end surface provided on said mandrel and lying in a plane normal to said machining axis,

a pad removably connected to said mandrel end surface and having a predetermined axial length, said pad having a diameter which is less than the diameter of the piston to be machined,

an end face provided on said pad and lying in a plane normal to the piston axis,

a tailstock assembly rotatable about said machining axis, having means co-operating with said pad end face to clamp therebetween a piston to be machined, the clamping pressure being adjustable,

jaws having inclined sides disposed on opposite sides of said machining axis,

actuator means associated with each jaw for moving the associated jaw from a retracted inoperative position to an extended operative position in which said jaw sides engages said datum cylindrical surface of said annulus and said outer surface of the piston, clamped between the pad end face and cooperating means on the tailstock assembly for limited radial movement, to allow alignment of said outer surface of said piston blank with said datum cylindrical surface by the jaw sides before retraction of the jaws and increase of the clamping pressure to hold said piston blank in datum radial and axial positions for machining of said outer surface in a single operation.

2. A method of setting up and holding a piston blank on an axis to allow machining of an outer surface thereof in a single operation, the method comprising:

defining a machining axis with a rotatable headstock including a mandrel,

selecting an annulus with an outer datum cylindrical surface having a diameter which is the same as the diameter of an outer surface of a piston to be machined,

attaching said annulus to a cylindrical outer surface of said mandrel coaxial with said machining axis, said datum cylindrical surface being coaxial with the machining axis,

selecting a pad having a diameter less than the diameter of said piston, and having a predetermined axial length between end faces thereof,

attaching said pad to an end surface of said mandrel lying in a plane normal to said machining axis, said pad end faces lying in planes normal to said machining axis,

providing a tailstock assembly having means rotatable about said machining axis and cooperating with said pad,

clamping said piston between a pad end face and the tailstock assembly cooperating means, said piston blank being capable of limited radial movement,

engaging said piston outer surface and said datum cylindrical surface of said annulus with actuator-driven jaws having inclined sides disposed on opposite sides of said machining axis, to align said piston outer surface with said datum cylindrical surface of said annulus,

increasing the clamping pressure to hold said piston in datum radial and axial positions for machining of said outer surface in a single operation, and

retracting the actuator-driven jaws prior to machining.

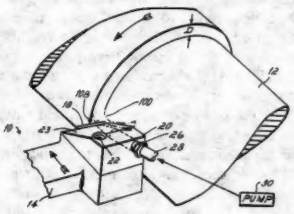
4,621,547
METHOD AND APPARATUS FOR MACHINING

Gerald K. Yankoff, 8273 Coppernail Way, Westchester, Ohio 45069

Continuation-in-part of Ser. No. 580,730, Feb. 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 470,193, Feb. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 263,305, May 13, 1981, abandoned. This application Aug. 5, 1985, Ser. No. 762,570

Int. Cl.[4] B23B *1/00, 27/10, 27/22*

U.S. Cl. 82—1 C **12 Claims**



1. A method of machining a workpiece with an insert having a top surface terminating with a cutting edge, said insert being mounted within a holder formed with at least one discharge orifice oriented to direct coolant onto the top surface of said insert toward said cutting edge, comprising the steps of:

positioning the discharge orifice relative to the insert mounted in the holder so that the distance between the cutting edge of the insert and the discharge orifice is in the range of about 0.040 inch to 0.440 inch;

engaging the workpiece with the cutting edge of the insert and rotating the holder or the workpiece to form chips having a bottom surface overlying the top surface of the cutting insert;

ejecting a jet of coolant from the discharge orifice onto the top surface of the insert and beneath the bottom surface of the chip at a velocity of at least 250 feet per second;

moving the insert with respect to the workpiece at a feed rate in the range of about 0.004 to 0.025 inches per revolution of the holder or workpiece.

4,621,548
MACHINE TOOL HOLDER UNIT

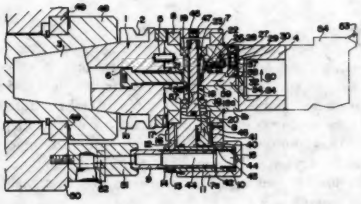
Haruaki Kubo, and Hidemori Kawashita, both of Higashiosaka, Japan, assignors to Daishowa Seiki Co., Ltd., Osaka, Japan

Filed May 4, 1984, Ser. No. 607,293

Claims priority, application Japan, May 16, 1983, 58-85614; Jan. 21, 1984, 59-9147

Int. Cl.[4] B23B *29/034*

U.S. Cl. 82—1.2 **12 Claims**



1. An interchangeable machine tool holder unit for use in a machining apparatus for the support of a machine element, which comprises:

a source of rotary drive;

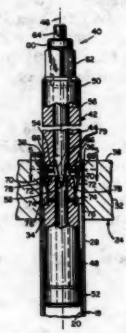
a generally elongated rotary body having ends;
a means coupling one of said ends of the elongated rotary body to said source of rotary drive;
a tool holder including a first supporting means supporting the machining element at one end thereof opposite to the rotary drive coupling means;
a second supporting means provided in said rotary body supporting said tool holder for movement in a radial direction of said rotay body;
a displaceable member which is axially displaceably carried by said rotary body;
a first cam means transmitting the axial displacement of the displaceable member to the tool holder to move the latter in a direction radially of the rotary body; and
an indexing mechanism intermittently moving the displaceable member in the direction axially of the rotary body each time the rotay body undergoes one complete rotation driven by the source of rotary drive, said indexing mechanism comprising an exteriorly threaded rod supported by a third supporting means within the rotary body so as to extend in a direction radially of said rotary body, a toothed wheel member mounted on one end of the threaded rod for rotation together therewith, and an indexing cam mounted on the theaded rod for movement in a direction axially to the threaded rod, said indexing cam being movable axially of and along the threaded rod as the threaded rod is turned about the longitudinal axis thereof and said displaceable member being axially moved in response to the axial movement of the indexing cam.

4,621,549

PRECISION INTERNAL TUBE CUTTER

Nick Nokovich, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 544,166, Oct. 21, 1983, abandoned. This application Sep. 12, 1984, Ser. No. 649,865
Int. Cl.[4] B23D *21/08, 21/14*
U.S. Cl. 82—1.2 **1 Claim**



1. For use in facilitating reconstitution of a fuel assembly including a stop nozzle having an adapter plate with a plurality of passageways defined through the adapter plate and a plurality of guide thimbles with hollow upper end portions inserted in the passageways and attached to the top nozzle adapter plate at the upper ends of the passageways, a precision internal tube cutter for severing the upper end portion of the guide thimble just below its region of attachment to the top nozzle adapter plate, comprising:

(a) an elongaged body having an upper end portion, means on said portion for rotating said body, a lower end portion, an intermediate portion integrally interconnecting said upper and lower end portions, and a longitudinal bore defined in said body so as to extend axially through said upper end portion and into at least said intermediate portion of said body;

(b) said upper and lower end portions of said body being of generally cylindrical cross-sectional shapes and having respective diameter sizes which adapt them to closely fit within and make guiding contact with the hollow upper end portion of one of the guide thimbles inserted and attached within one of the passageways of the top nozzle adapter plate, said lower end portion of said body being relatively smaller in diameter size than said upper end portion thereof so as to adapt said lower end portion for receipt within a smaller inside diameter size portion of said guide thimble than the inside diameter size of the guide thimble upper end portion in which said upper end portion of said body is received;

(c) said intermediate portion of said body being of a cross-sectional shape reduced in size relative to the respective diameter sizes of said upper and lower end portions which prevents it from making contact with the hollow upper end portion of the guide thimble, said intermediate portion having a radially extending slot formed therein which intersects said longitudinal bore and is composed of opposite slot portions, said intermediate portion including a pair of recessed notches defined therein adjacent said slot portions;

(d) a stem disposed within said longitudinal bore and having a continuous conical surface defined at a lower end thereof which intersects said radial slot so as to divide said slot into opposite portions which open at the exterior of said intermediate body portion, said stem including a flange portion which limits axial movement of said stem, said stem at an upper end being threadably connected to said upper end portion of said body such that upon rotation of said stem relative to said body, said stem will move axially along said bore between an upper retracted position and a lower extended position;

(e) a pair of slides mounted within said respective slot portions and having respective inner ends with surfaces defined thereon having inclined configurations complementary to the inclined configuration of said conical surfaces on said lower end of said stem and disposed adjacent and in contact with said lower end of said stem such that said slides will move radially between outward and inward positions upon corresponding movement of said stem between its lower and upper positions;

(f) a pair of leaf springs mounted on said intermediate body portion and engaged with said slides, said leaf springs each having a pair of opposite ends, one end of each spring being engaged with one of said slides and the other end of each spring being fastened to said intermediate body portion within one of said notches therein, said springs imposing an inwardly-directed biasing force on said slides for maintaining its inclined surfaces in contact with said conical surface of said stem; and

(g) a pair of cutting wheels rotatably mounted on said respective slides so as to define a common cutting plane upon rotation of said body within the hollow upper end portion of the guide thimble, said cutting wheels being disposed in outwardly advancing cutting positions which progressively sever the upper end portion of the guide thimble within said common plane as said respective slides are moved from their inward to outward positions and said cutter body is rotated, said cutting wheels being disposed in withdrawn positions when said respective slides are disposed in their inward positions which facilitates insertion and withdrawal of said cutter body into and from the guide thimble;

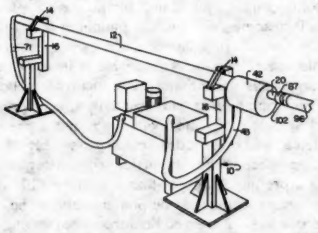
(h) said cutter body, stem and slides being composed of a non-corrosive, anti-galling stainless steel alloy, such as Nitronic-60, which adapts said cutter to work for extended periods of time on an irradiated partiallly spent fuel assembly submerged in water.

4,621,550

MACHINE FOR FEEDING BAR STOCK TO A TURNING TOOL

Joseph F. Berns, 1171 Georgia La., Cincinnati, Ohio 45215

Filed Oct. 5, 1984, Ser. No. 658,408
Int. Cl.[4] B23B *13/02, 13/08*
U.S. Cl. 82—2.5 6 Claims



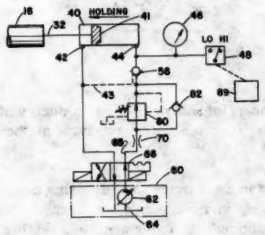
1. A machine for supporting a bar feed stock workpiece having a non-circular cross-section in a turning tool which comprises a main tube having a cylindrical inner wall, an intermediate guide tube rotatably mounted inside the main tube, the intermediate guide tube having a cylindrical outer wall, the intermediate guide tube having an elongated interior opening receiving the workpiece with an end portion of the workpiece extending into a spindle of the turning tool and with the interior opening fitting closely around the bar feed stock workpiece, means for connecting the intermediate guide tube to the spindle to rotate therewith and with the workpiece, means for holding liquid in the main tube surrounding the intermediate guide tube, the intermediate guide tube moving toward centered position in the main tube as the spindle turns with the intermediate guide tube and the workpiece, means in said intermediate guide tube to advance the workpiece, and liquid means under pressure to supply said advancing means and fill the main tube.

4,621,551

TAILSTOCK QUILL HYDRAULIC CIRCUIT

Martin L. Silverman, South Euclid, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Continuation of Ser. No. 396,023, Sep. 13, 1982, abandoned. This application Oct. 5, 1984, Ser. No. 658,445
Int. Cl.[4] B23B *23/00*
U.S. Cl. 82—31 2 Claims



1. A machine tool comprising a headstock means (11) for gripping and rotating a workpiece, a tailstock quill (32) for supporting one end of the workpiece as it is rotated by said headstock means, fluid motor means (40) for moving said quill between a retracted condition in which said quill is ineffective to support the workpiece and an extended condition in which said quill supports one end of the workpiece, said fluid motor means including first and second motor chambers, conduit means (65) for conducting fluid flow to and from said fluid motor means during movement of said quill between said retracted and extended conditions, said conduit means including first conduit means for transmitting fluid pressure to said first motor chamber during operation of said fluid motor means to move said quill from the retracted condition to the extended condition and second conduit means for transmitting fluid pressure to said second motor chamber during operation of said fluid motor means to move said quill from the extended condition to the retracted condition, check valve means (56) connected with said first conduit means and operable from an open condition to a closed condition to block fluid flow from said first motor chamber in the event of a reduction in fluid pressure in a portion of said first conduit means during a machining operation with said quill in the extended condition, means for conducting fluid pressure from said second conduit means to said check valve means to maintain said check valve means to the open condition under the influence of the fluid pressure in said second conduit means during operation of said fluid motor means to move said quill from the extended condition to the retracted condition, orifice means (70) for restricting fluid flow to said first motor chamber during operation of said fluid motor means to move said quill from the retracted condition to the extended condition and for restricting fluid flow from said first motor chamber during operation of said fluid motor means to move said quill from the extended condition to the retracted condition, valve means (66) for directing fluid flow through said conduit means to said fluid motor means to effect operation of said fluid motor means to move said quill between the retracted and extended conditions, said fluid motor means, conduit means and valve means cooperating to change the fluid pressure in at least a portion of said conduit means upon movement of said quill to either the extended condition or a retracted condition, fluid pressure sensing means (48) connected in fluid communication with said conduit means for detecting the change in fluid pressure which occurs when said quill reaches the extended condition upon completion of movement of said quill from the retracted condition to the extended condition and for detecting the change in fluid pressure which occurs when said quill reaches the retracted condition upon completion of movement of said quill from the extended condition to the retracted condition, and control means (89) for initiating a machine tool function in response to said fluid pressure sensing means detecting a change in fluid pressure upon movement of said quill to the extended condition and for initiating a machine tool function in response to said fluid pressure sensing means sensing a change in fluid pressure upon movement of said quill to the retracted condition.

4,621,552

METHOD AND APPARATUS FOR SEPARATING PRINTED-CIRCUIT BOARDS FROM MULTI-BOARD PANELS

Gilbert T. Lopez, Longmont, Colo., assignor to Cencorp, Boulder, Colo.

Filed Jan. 4, 1985, Ser. No. 689,078
Int. Cl.[4] B26D *5/26*
U.S. Cl. 83—27 20 Claims

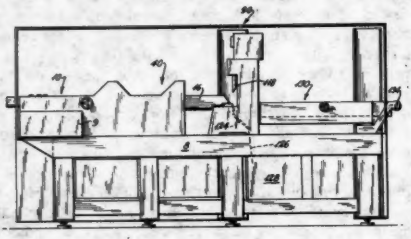
1. A method of handling a panel automatedly, said panel having means for referencing positional control of said panel, and comprising the steps of:

receiving said panel at a feed assembly input;

searching for said panel referencing means;

clamping said panel according to and upon locating said referencing means;

feeding said panel, while clamped, to a processing station and indexing said feeding according to a controller; and



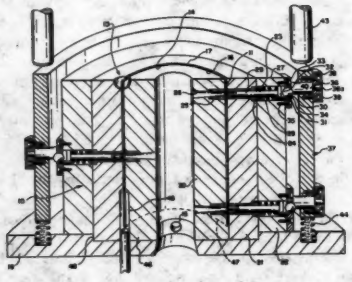
subdividing said panel at said processing station according to said controller.

4,621,553

VERTICAL PIERCE DIE

Henry Gruchalski, and Albert P. Gruchalski, both of 5737 W. Newport, Chicago, Ill. 60634

Filed May 30, 1984, Ser. No. 615,329
Int. Cl.[4] B26D *1/00;* B21D *28/28*
U.S. Cl. 83—194 **17 Claims**



1. In a piercing die assembly for punching a plurality of radially extending holes in a tubular member,

a die structure having an open end for receiving a tubular member to be punched and with the die structure having means for supporting the tubular member in a pre-punching position including radially inner and outer die walls for backing up inner and outer wall surfaces of the tubular member to be punched,

a plurality of spaced radially movable punch assemblies operatively connected with the die structure and having a series of radially movable punches, the punch assemblies having ball bearings positioned at radially outer ends of the punches and with each bearing and its associated punch being radially movable simultaneously together,

a vertically movable ring-shaped actuator member positioned radially outwardly of the punches and movable axially from a pre-punching position to a post-punching position,

a plurality of spaced cams mounted on the ring-shaped actuator member and movable up and down therewith from a pre-punching position,

a plurality of spaced cams mounted on the ring-shaped actuator member and movable up and down therewith from a pre-punching position to a post-punching position and with the cams being positioned for contacting and actuating the ball bearings and the punches to punch holes in the tubular member in a preplanned manner,

press means for moving the actuator member from its pre-punching position and actuating said cams to actuate the punches to punch the tubular member, each of said cams being associated in radial adjacency with an associated one of said punch assemblies and workable together for punching holes in the tubular member,

means for returning said press means to its pre-punching position,

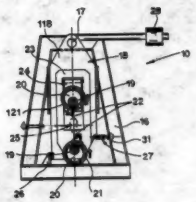
retraction means for retracting the bearings and the punches after completing a punching operation to place the punches in readiness for another punching operation, the vertically movable ring-shaped actuator member comprising a solid metal ring and engageable at its upper end by said press means for moving the actuator member, said press means including circumferentially spaced press rods engaged against said solid metal ring, and a press plate connected to said press rods in unitary assembly, the press plate being spaced from the article supporting structure when in a pre-punching position a sufficient distance to allow a tubular member to be punched and to be moved into and out of said open end before and after punching.

4,621,554

FLYING SHEARS TO SHEAR ROLLED PRODUCTS

Alfredo Poloni, Ronchi Dei Legionari, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Italy

Filed Nov. 27, 1984, Ser. No. 675,311
Claims priority, application Italy, Dec. 9, 1984, 83512 A/83
Int. Cl.[4] B23D *25/00;* B26D *1/58, 1/60*
U.S. Cl. 83—317 **20 Claims**



1. A flying shears for shearing rolled products and capable of working on one or more rolled products at the same time comprising:

shearing blades,

blade support means carrying said shearing blades and capable of moving in a coordinated manner,

means for guiding the movement of said blade support means,

cam means for driving said blade support means through a rotational path,

drive shaft means extending along an axis substantially perpendicular to the direction of movement of rolled product, communicating mechanical energy to said cam means, and

moveable support means supporting said drive shaft means, said moveable support means being movable along a trajectory substantially parallel to that of the rolled product.

4,621,555

APPARATUS FOR CUTTING A POROUS CONCRETE BLOCK WHICH IS STILL IN A PLASTIC CONDITION

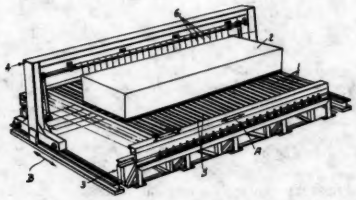
Wilfried Hartmann, Emmering, Fed. Rep. of Germany, assignor to Hebel GmbH Holding, Emmering, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,509

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1984, 3434505

Int. Cl.[4] B26D *5/00, 1/18*

U.S. Cl. 83—620 7 Claims



1. In an apparatus for cutting a porous concrete block which is still in a plastic condition, having a horizontal cutting table comprising a plurality of bars which are arranged parallel and at a spacing from each other, for receiving the parallelepipedic porous concrete block which is lying on its wide side, and having a cutting frame which is movable relative to the cutting table in the longitudinal direction of the bars, with a plurality of cutting wires which extend in vertical planes and which are passed through the slots between the bars and by means of which the block can be cut up in a first horizontally extending direction of cut, wherein the bars are mounted horizontally displaceably perpendicularly to their longitudinal direction on a main frame structure and disposed between the bars are spacer members which restrict the relative movement of the bars away from and towards each other, to the width of the cutting gap, in such a way that the mutual spacing of the bars which are drawn apart from each other prior to the cutting operation can be reduced, after the cutting operation in the first direction of cut, by pushing the bars together, by the width of the cutting gap, comprising the improvement wherein each bar is divided in its longitudinal direction along a vertical plane and comprises two bar halves which are horizontally adjustable relative to each other perpendicularly to the longitudinal direction and the mutual spacing being adjustable by means of a respective adjusting device engaging each of the oppositely disposed ends of the bar halves, further that provided at each adjusting device is a coupling means which permits the two bar halves respectively belonging to a bar to be completely released, and that provided at one of the two bar halves is a clamping means with which said bar half can be fixedly clamped to a clamping bar member at any point thereon, said clamping bar member extending in the direction of displacement of the bars and being connected to the main frame structure.

4,621,556

RELIEVED SERRATED DIES FOR ROTARY PUNCHING UNITS

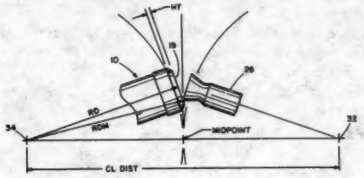
John R. Soltysiak, Blasdell, and Jimmie A. Harrod, Grand Island, both of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed May 8, 1984, Ser. No. 608,345

Int. Cl.[4] B26F *1/10*

U.S. Cl. 83—670 4 Claims

1. A rotary serrated die for working with a rotary punch, said die and punch each having an axis of rotation and said die



having a minimum die cutback angle θ, wherein

$$\theta \geq \arccos\left[\left(\frac{CL\ DIST}{2}\right)/RDM\right]$$

where CL DIST is the centerline distance between punch and die axes of rotation, said CL DIST having a midpoint,

$$RDM = \left(RD^2 + \left(\frac{MD}{2}\right)^2\right)^{\frac{1}{2}}$$

$$RD = \frac{CL\ DIST}{2} + HT,$$

MD is a die internal diameter, and

HT is the height of the die, said die height defined by the distance that the die extends radially outward from the die axis of rotation beyond the distance from the die axis to the midpoint.

4,621,557

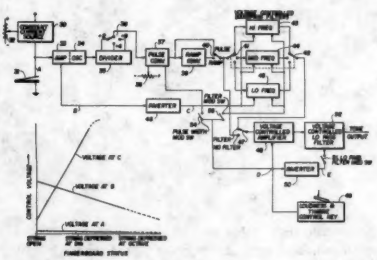
ELECTRONIC MUSICAL INSTRUMENT

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corp., Salem, Mass.

Continuation of Ser. No. 526,863, Aug. 26, 1983, abandoned. This application Nov. 6, 1985, Ser. No. 827,651

Int. Cl.[4] G10H *1/12, 1/46, 5/10*

U.S. Cl. 84—1.19 2 Claims



1. An electronic musical instrument having a plurality of elongated playing members, wherein sounds of varying pitch are produced by depressing the said playing members at different positions along their lengths, and wherein the timbre and loudness of the sounds produced by playing said instrument are continuously controllable by the performed during playing, to enable the sound and feeling of an acoustic musical instrument to be more nearly attained, comprising the following associated with each playing member,

means for producing a square wave audio output signal, the frequency of which is dependent on the position at which the playing member is depressed by the performer,

means for converting said square wave output signal to a

pulse signal, said means for converting having a pulse width control input for receiving a signal for controlling the width of the pulses of said pulse signal,

voltage controlled filter means having a controllable pass band and a pass band control input for receiving a signal for controlling said pass band,

means for feeding said pulse signal to said filter means,

voltage controlled amplifier means for amplifying said pulse signal after it is filtered by said filter means, said voltage controlled amplifier means providing an amplified tone output and having a gain control input for receiving a gain control signal,

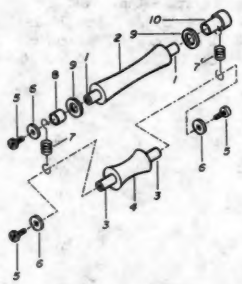
manually adjustable pivotable key control means capable of being reproducibly moved to a plurality of key control positions for generating a key control signal for varying both the amplitude and overtone content of said tone output, said key control signal or a signal derived therefrom being fed to said gain control input of said voltage controlled amplifier means, said pass band control input of said filter means, and said pulse width control input of said means for converting the square wave to a pulse signal, for simultaneously controlling the loudness and timbre of said tone output as the position of said key control means is changed.

4,621,558

PERMANENTLY RESIDING OR REMOVABLE CAPO

Swany D. Cornette, Rte. 1, Paint Lick, Ky. 40461

Filed May 6, 1985, Ser. No. 730,848
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—318 **4 Claims**



1. A capo device for use on the neck of a stringed musical instrument, said neck having a top surface with a fingerboard thereon and a curved bottom surface, and strings tensioned over said neck, said capo comprising:

an elongated top roller having a length sufficient to transversely span said fingerboard and a cylindrical surface which matches the transverse curvature of said fingerboard;

an elongated bottom roller having a concave cylindrical surface which makes a line contact with a substantial portion of the transverse curvature of said curved bottom surface; and

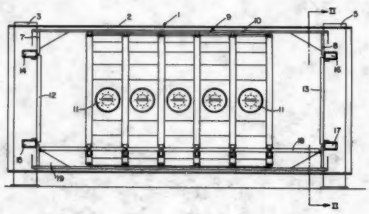
tension means connecting said top and bottom rollers to force said rollers toward one another to stop said string at various positions on said fingerboard.

4,621,559

DETONATION CHAMBER

Johnny Ohlson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Jan. 2, 1985, Ser. No. 688,389
Claims priority, application Sweden, Jan. 2, 1984, 8400003
Int. Cl.[4] F42B *33/00, 33/06;* **F42D** *5/04*
U.S. Cl. 86—50 **6 Claims**



1. Apparatus for containing high pressure and fragments produced by an explosion comprising:

an inner chamber having a cylindrical side wall and end walls closing said chamber, said side wall having an internal surface,

an open-ended cylindrical outer shell surrounding said chamber and spaced from said cylindrical side wall of said inner chamber and

a liner shell disposed inside said inner chamber and covering at least a central portion of said internal surface of said cylindrical side wall,

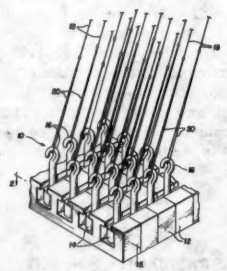
said liner shell comprising a plurality of ring-shaped section members, said section members comprising a plurality of curved segments having inwardly projecting rims at each end, said segments further being positioned side by side and held together by a circular fitting member on said rims.

4,621,560

METHOD OF SEQUENCED BRAIDER MOTION FOR MULTI-PLY BRAIDING APPARATUS

Richard T. Brown, Woodbridge, Va., and Eric D. Ratliff, Washington, D.C., assignors to Atlantic Research Corporation, Alexandria, Va.

Filed Apr. 11, 1985, Ser. No. 722,064
Int. Cl.[4] D04C *1/00, 3/00*
U.S. Cl. 87—8 **5 Claims**



1. In a braiding method wherein fiber carriers are arranged in rows and columns which are moved in a predetermined alternating sequence to intertwine the fibers and form a braided article, the improvement comprising the steps of:

moving a selected intermediate row a distance sufficient to block movement of a column on one side thereof, and

applying a tamping force to said column to move it against said one side of said selected row while it is blocking movement of said column,

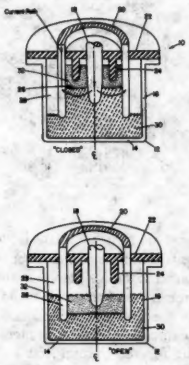
whereby said column is temporarily shortened to facilitate proper alignment of the fiber carriers therein.

4,621,561

SWITCH FOR INDUCTIVE ENERGY STORE TRANSFER CIRCUIT

William F. Weldon, Austin, Tex., assignor to Board of Regents, Univ. of Texas System, Austin, Tex.

Filed Jun. 22, 1983, Ser. No. 506,887
Int. Cl.[4] H01H *29/00*; F41F *1/02*
U.S. Cl. 89—8 **18 Claims**



1. An opening switch for breaking a connection between a pair of electrical conductors, comprising:

a closed container having a bottom and an upstanding wall;

a first electrode extending into the interior of the container, for carrying electrical current in a first direction;

a second electrode extending into the interior of the container and circumscribing the first electrode, for carrying electrical current in a second direction opposite to the first direction and parallel thereto;

said first and second electrodes defining a inner chamber space;

said second electrode and said container wall defining an outer chamber space;

a quantity of an electrically conductive liquid disposed in said container for bidirectional flow between the inner and outer chamber spaces; and

a gas under high pressure disposed within the outer chamber space, for biasing said liquid into the inner chamber space so as to establish an electrical current path between the electrodes, and for yieldably resisting expelling movement of the liquid from the inner chamber space due to magnetic force developed by a flow of oppositely directed electrical currents in the electrodes.

4,621,562

REMOTE CONTROL ROBOT VEHICLE

Michael J. R. Carr; Colin Sennett, both of Newcastle; Brian Wilkinson, North Shields, all of England, and Russell E. Winn, deceased, late of Cork, Ireland (by Geraldine Betty Winn, legal representative), assignors to Monitor Engineers Limited, Wallsend, England

Filed May 31, 1983, Ser. No. 499,257
Int. Cl.[4] F41C *7/00*
U.S. Cl. 89—41.05 **18 Claims**

1. An unmanned remote control robot vehicle which includes a chassis, two pairs of driving wheels, each said pair of wheels being mounted on a support secured to the chassis of the vehicle which supports are each mounted for pivotal movement about a generally horizontal axis entending longitudinally of the vehicle and a third pair of driving wheels mounted on the chassis is intermediate of said two pairs of driving wheels, means being provided for driving those wheels on the same side of the vehicle synchronously with each other.

9. An unmanned remote control robot vehicle comprising:

a chassis having first and second ends;

a first subframe pivotally mounted about the longitudinal axis of said first end of said chassis;

a second subframe pivotally mounted about the longitudinal axis of said second end of said chassis;

a first pair of driving wheels rotatably disposed at the distal ends of said first subframe;

a second pair of driving wheels rotatably disposed at the distal ends of said second subframe;

a third pair of driving wheels rotatably disposed on each side of said chassis between said first and second pairs of driving wheels;

a plurality of drive motor means mounted on said chassis wherein each of said drive motor means is coupled to a corresponding individual driving wheel;

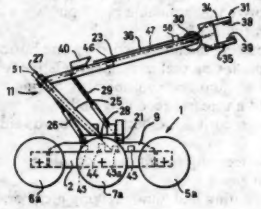
transmission means for transmitting rotational energy between each of said drive motor means and its associated driving wheel;

a lifting apparatus pivotally connected to said front subframe;

a turret assembly rotatably connected to said chassis;

means for rotating said turret assembly;

a first arm, having first and second ends, wherein said first end of said first arm is pivotally connected to said turret assembly;



a second arm, having first and second ends, wherein said first end of said second arm is pivotally connected to said second end of said first arm;

a first jackscrew means pivotally disposed between said turret assembly and said first arm;

means for rotating said first jackscrew;

a second jackscrew means pivotally disposed between said turret assembly and said second arm;

means for rotating said second jackscrew;

a claw, comprising first and second claw fingers, disposed at the distal end of said second arm;

motor means for operating said claw device;

a pair of electrical contacts disposed on the distal ends of each of said claw fingers for energizing devices placed in electrical contact therewith;

shotgun means disposed on said second arm wherein said shotgun is remotely activated, wherein the longitudinal axis of the barrel of said shotgun means is parallel to the longitudinal axis of said second arm and wherein the muzzle of said shotgun means is pointed in the direction of the distal end of said second arm;

a closed circuit TV camera disposed on said second arm wherein the image of said camera is aligned with the sight of said shotgun means;

a remote control console further comprising means for individually controlling each of said electrically operated devices; and

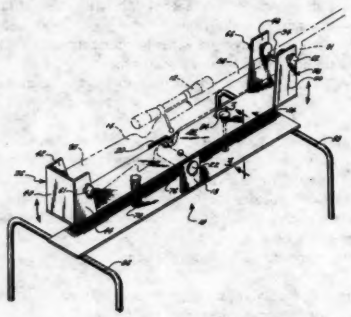
wire means electrically connecting said console to said electrically operated devices.

4,621,563

APPARATUS FOR ALIGNING GUN SIGHTS

Mark D. Poiencot, Houma, La., assignor to Sure Shot of Louisiana, Inc., Houma, La.

Filed Nov. 5, 1984, Ser. No. 668,087
Int. Cl.[4] F41F *25/00*
U.S. Cl. 89—37.04 **2 Claims**



1. An apparatus for aligning gun sights, comprising:
an elongated base;
a pair of parallel uprights fixed to the elongated base and carrying a horizontal, rotatable pivot pin therebetween, said horizontal, rotatable pivot pin being rotatable about its longitudinal axis;
a gun-receiving member carried by said horizontal, rotatable pivot pin for pivotal movement relative to said elongated base, said gun-receiving member having a butt-receiving end and a forearm-receiving end;
means for securing the butt of a gun to said butt-receiving end;
means for securing the forearm of said gun to said forearm-receiving end;
means for tilting said gun-receiving member, relative to said elongated base, about said horizontal, rotatable pivot pin to an adjusted position for aligning the gun sight of said gun with a target, said means for tilting said gun-receiving member being positioned intermediate an end of said gun-receiving member and said horizontal, rotatable pivot pin; and a spring fixed between the elongated base and said gun-receiving member for absorbing the recoil of said gun when said gun is fired, and for returning said gun-receiving member to said adjusted position.

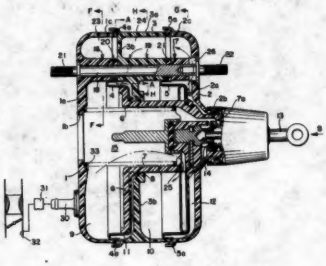
4,621,564

FORCE MULTIPLYING DEVICE FOR VEHICLE BRAKE SYSTEMS

Michiharu Nishii, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sep. 27, 1984, Ser. No. 655,157
Claims priority, application Japan, Sep. 30, 1983, 58-150514[U]
Int. Cl.[4] F01B *19/00*
U.S. Cl. 91—534 **8 Claims**

1. A brake force multiplying device comprising a shell which includes a first end housing, a second end housing and an intermediate housing disposed between the first and second end housings, said intermediate housing having partition wall means dividing the interior of the shell into first and second compartments, a first pressure responsive element provided between the first end housing and the intermediate housing to divide the first compartment into a first constant pressure chamber and a first actuating pressure chamber, a second pressure responsive element provided between the intermediate housing and the second end housing to divide the second compartment into a second constant pressure chamber and a second actuating pressure chamber which are arranged in the same sequence as the sequence in which said first constant pressure chamber and said first actuating chamber are arranged, means for connecting said first and second constant pressure chambers with pressure source means, valves means for connecting said first and second actuating pressure chambers alternatively with said constant pressure chambers and the atmosphere, said first and second end housings having axially



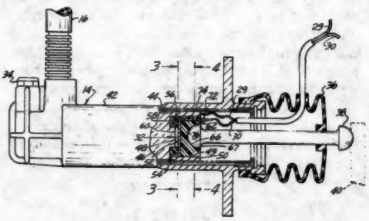
aligned sleeve means, said intermediate housing having intermediate sleeve means which is disposed between and in abutting relationship with the sleeve means in the first and second end housings, a force transmitting rod means passing through the sleeve means in the first and second end housings and the intermediate sleeve means in the intermediate housing, said sleeve means having formed therein first and second auxiliary chambers divided by said partition wall means of the intermediate housing, at least one of said auxiliary chambers providing communication between said constant pressure chambers or actuating pressure chambers.

4,621,565

HYDRAULIC SLAVE CYLINDER SWITCH

Keith V. Leigh-Monstevens, Troy, Mich., assignor to Automotive Products plc, Warwickshire, England

Filed Aug. 15, 1984, Ser. No. 641,056
Int. Cl.[4] F01B *31/12*
U.S. Cl. 92—5 R **7 Claims**



1. An electrical switch for a hydraulic system comprising a hydraulic cylinder, a piston movable within said cylinder under the influence of fluid pressure within said cylinder, and a metallic piston rod disposed between said piston and a load, said switch comprising a compressible member mounted in said piston transversely of said piston rod, said piston having an electrically conductive portion, an electrically conductive member facing said compressible member and positioned between said piston rod and said electrically conductive portion of said piston, and an electrically non-conductive insert between said piston rod and said electrically conductive member for insulating said piston rod from said electrically conductive

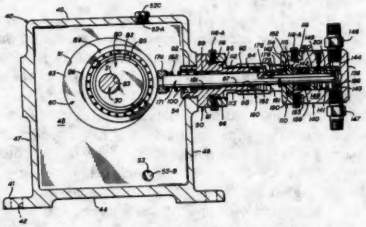
member, wherein said compressible member normally maintains said electrically conductive member spacially from said electrically conductive portion of said piston, said electrically conductive member is positioned relative to said electrically conductive portion of said piston and said compressible member has a compressibility such that when fluid pressure is applied to said piston to move said piston rod for displacing said load said compressible member is compressed and said electrically conductive member engages said electrically conductive portion of said piston for closing an electric circuit.

4. In combination with a hydraulic cylinder having a piston displaceable by fluid pressure, said piston being adapted to actuate a piston rod connected to a mechanical component, a pressure actuated normally open switch associated with said cylinder, said switch being operable to close an electrical circuit only when fluid pressure in said cylinder reaches a predetermined value corresponding to full actuation of said mechanical component, said switch comprising a compressible member mounted in said piston transversely of said piston rod, said piston having an electrically conductive portion, an electrically conductive member facing said compressible member and positioned between said piston rod and said electrically conductive portion of said piston, and an electrically non-conductive insert between said piston rod and said electrically conductive member for insulating said piston rod from said electrically conductive member, wherein said compressible member normally maintains said electrically conductive member spacially from said electrically conductive portion of said piston, said electrically conductive member is positioned relative to said electrically conductive portion of said piston and said compressible member has a compressibility such that when fluid pressure is applied to said piston to move said piston rod for actuating said mechanical component said compressible member is compressed and said electrically conductive member engages said electrically conductive portion of said piston for closing an electrical circuit.

4,621,566
ELECTRIC PUMP

J. Wallace Johnson, Porter, and Lewis C. LoMaglio, Kingwood, both of Tex., assignors to Liquid Level Lectronics, Inc., Porter, Tex.

Continuation-in-part of Ser. No. 777,709, Sep. 11, 1985. This application Oct. 18, 1985, Ser. No. 789,155
Int. Cl.[4] F04B *39/14, 49/00*
U.S. Cl. 92—13.4 **2 Claims**



1. An injection pump having an input shaft capable of being rotated by an outside source of power, said pump comprising:

housing member rotatably receiving said input shaft, said shaft having a cam eccentrically mounted thereon, said housing positioning ball bearing assembly means on opposite sides of said cam, for rotatably supporting said shaft, said cam carrying a further ball bearing assembly means around its periphery, said housing also including pumphead receiving means extending through a wall of said housing;

pumphead means in communication with said further ball bearing assembly means, said pumphead means including; mounting means adapted to be received by said pumphead receiving means, said mounting means being axially bored and carrying means within said bore for (1) reciprocatingly receiving a plunger and (2) receiving spring means for biasing said plunger toward said cam,

spacer means removably secured to both said mounting means and to an injection fluid reservoir means, said spacer means being axially bored for receiving said plunger and further having aperture means for permitting access to an adjustment collar,

said adjustment collar including means which, in conjunction with said spacer means, adjusts the stroke of said plunger,

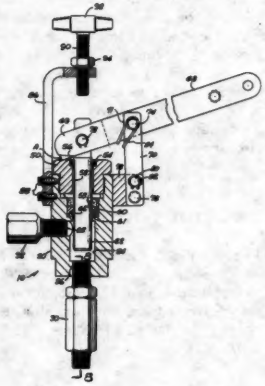
said injection fluid reservoir means being axially bored for receiving said plunger, said reservoir means including injection fluid inlet and outlet communicating with a reservoir portion, and

reciprocating plunger means in contact, at one end thereof, with said further ball bearing assembly means, its other end being reciprocatingly received by said reservoir portion of said reservoir means, said plunger further carrying means limiting said plungers stroke to the linear separation between one end of said adjustment collar and an adjacent web of said spacer.

4,621,567
BEAM PUMP

James F. Williams, 25569 Via Velador, Valencia, Calif. 91355

Filed Mar. 26, 1984, Ser. No. 593,643
Int. Cl.[4] F15B *15/24;* F01B *9/00;* F04B *21/00*
U.S. Cl. 92—13.7 **5 Claims**



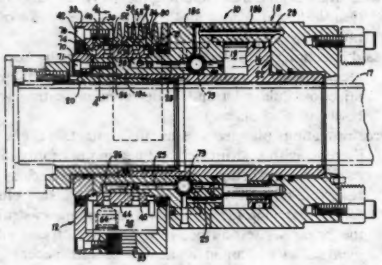
1. In a walking beam pump having a pump body with a guide cavity which a pump shaft moves slidably within for the pumping of a chemical, the pump shaft is pivotally connected to a lever bar with the other end of the lever bar connected to a walking beam cable and the center portion of the lever bar pivotally connected to a pivot support bar with the other end of the pivot support bar pivotally connected to the pump body, the improvement comprising, pivot limiting holes in the pivot support bar, said holes loosely fitting around a pivot limiter connected to the beam pump body whereby the sides of said pivot limiting holes are enabled to come to rest against said pivot limiter to prevent non-alignment between the pump shaft and the pump body due to excessive longitudinal horizontal movement of the lever bar by reason of excessive pivoting of the support bar that would otherwise occur.

4,621,568

ROTARY HYDRAULIC CYLINDER

Edward D. Gailey, Mentor, Ohio, assignor to The S-P Manufacturing Corporation, Cleveland, Ohio

Filed Nov. 30, 1984, Ser. No. 676,795
Int. Cl.[4] F01B *31/00*
U.S. Cl. 92—106 15 Claims



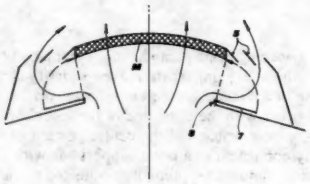
1. In a rotary hydraulic cylinder for operating an actuator of a rotary work holder and having an external cylindrical bearing surface, a piston chamber within the cylinder, an axially movable piston in the chamber connected with the actuator, a non-rotary fluid distributor surrounding the bearing surface of the cylinder and having an inner cylindrical bearing surface mating therewith, two axially spaced grooves at the bearing surfaces, a fluid inlet and a fluid outlet in the fluid distributor each communicating with one of the two spaced grooves, and at least two passageways associated with the cylinder each communicating between one of the two spaced grooves and one of two opposite ends of the piston chamber, the improvement wherein the fluid distributor includes an outer housing and an inner cylindrical sleeve, the inner cylindrical bearing surface is on the cylindrical sleeve, a low-friction chemical coating is adhered to one of the bearing surfaces, and the improvement further includes means to frictionally restrain rotation of the sleeve relative to the housing against forces normally applied to the sleeve in operation, said sleeve being otherwise free to rotate within the housing.

4,621,569

EXTRACTOR VENTILATOR FOR INDUSTRIAL BUILDINGS

Paolo Fioratti, Via P. Castaldi, 23, 20124 Milan, Italy

Continuation of Ser. No. 386,316, Jun. 8, 1982, abandoned. This application Feb. 15, 1985, Ser. No. 701,666
Claims priority, application Italy, Jun. 10, 1981, 22235 A/81
Int. Cl.[4] F24F *7/02*
U.S. Cl. 98—422 9 Claims



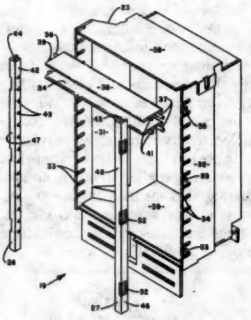
1. An extractor designed to increase and regulate the natural ventilation in buildings, the extractor being adapted to be installed on the outside of an opening provided in the roof of such buildings, the extractor comprising controlled flow means for passing at least a minimum flow of air and a plurality of free flow passage means at the exterior of said extractor for passing an additional flow of air, said controlled flow means comprising air permeable, upper exterior surfaces of the extractor, which surfaces substantially span said opening and are upwardly inclined so as to define a highest portion of said extractor located generally centrally over said opening, said free flow passage means arranged along opposite lower edges of said upper exterior surfaces and including blade means for dividing said free flow passage means into a plurality of smaller openings so as to substantially prevent crosswinds from entering said extractor through said free flow passage means; and means for regulating the amount of flow passing through said free flow passage means.

4,621,570

LOUVER ASSEMBLY

Theodore S. Bolton, Liverpool, and Robert J. Whitwell, Nedrow, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 30, 1985, Ser. No. 770,950
Int. Cl.[4] F24F *13/00*
U.S. Cl. 98—114 8 Claims



1. In an air conditioning apparatus of the type having an air discharge opening with a plurality of louvers adjustably disposed therein for directing the flow of discharge air, an improved louver mounting assembly comprising:

a pair of laterally spaced support members partially defining the air discharge opening, and having a plurality of longitudinally spaced rearwardly extending slots formed at the forward edges thereof;

a plurality of louvers with each having a mounting pin and a pivot pin on each end thereof, said mounting pins being sized and positioned so as to be slideably receivable and pivotably mounted in said support slots to suspend said louvers in mounted positions between said side support members, and said pivot pins being disposed forwardly of said mounting pins and outside of said support slots;

a pair of retainer bars disposed, in rearwardly abutting relationship with said mounting pins and including means for engaging said pivot pins to form a gang bar for coordinating the angled positions of the louvers; and

means for securing said retainer bars to said support members to maintain said louvers in their mounted positions.

4,621,571

SATELLITE COFFEE BREWING SYSTEM

Melvin F. Roberts, Niles, Ill., assignor to Bloomfield Industries, Inc., Chicago, Ill.

Filed Nov. 28, 1984, Ser. No. 675,531
Int. Cl.[4] A47J *31/24, 31/06*
U.S. Cl. 99—280 59 Claims

1. A satellite coffee brewing system comprising:

a central brewing unit including

a housing,

a water tank means interiorly of said housing and associat-

ing with a heating means, said tank means being in fluid communication with a cold water inlet valve means for the admission of water thereto,

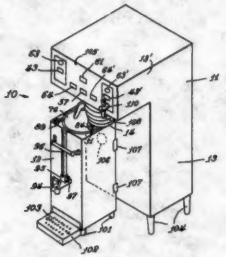
a siphon tube means for discharging hot water displaced from the tank means upon the admission of inlet water at said inlet valve means,

a spray head assembly associating with said siphon tubes means and adapted to receive siphoned water therefrom and for discharging said water to a brew chamber,

means for removably mounting a brew chamber to the exterior of said housing to be in fluid communication with said spray head assembly,

an adjustable brew chamber for holding coffee grounds and being removably mounted at said mounting means, said brew chamber including a discharge orifice at the a bottom thereof and the brew chamber being capable of adjustment whereby to position said discharge orifice into at least two discharge positions,

safety switch means controlling the initiation of a brewing



cycle and being arranged to be closable by the brew chamber upon the positioning of the brew chamber at one of said discharge positions;

a plurality of satellite coffee receptacle units having an insulated coffee-holding reservoir therein and adjustable cover means thereover, said satellite units including spigot means for the dispensing of coffee therefrom, said satellite units further being interchangeable and capable of being arranged with said central brewing unit for receipt of brewed coffee from any of said discharge positions of said brew chamber, wherein at least two said satellite units are capable of being simultaneously arranged with said central brewing unit for sequential receipt of brewed coffee and having a combined width no greater than the width of said central brewing unit housing, said satellite units further being free standing and portable wherein the satellite units are adapted to dispense coffee while arranged at the central brewing unit and transportable to remote locations for dispensing coffee remote from the central brewing unit.

4,621,572

APPARATUS FOR PROCESSING FAVA BEANS HAVING PODS AND SEEDS

John Boggiano, 7899 DeMartini La., Linden, Calif. 95236

Filed Apr. 19, 1985, Ser. No. 725,004

Int. Cl.[4] A23N *5/00*

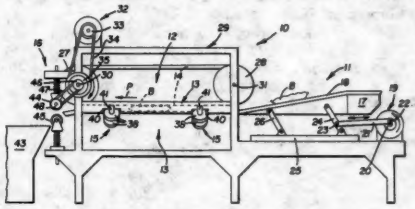
U.S. Cl. 99—574 **9 Claims**

1. An apparatus for processing fava beans having pods and seeds comprising

first means for supporting and moving said beans along a path, and

second means for cutting the pods of said beans during their movements along said path to facilitate separation of said pods from the seeds of said beans,

said first means comprising a horizontally disposed stationary trough defining an elongated bed thereon extending in the direction of said path and adapted to support said beans thereon and a moveable conveyor means extending in the direction of said path in overlying relationship



relative to said bed for engaging and moving said beans along said path.

4,621,573

APPARATUS FOR CLEANING FRUITS AND VEGETABLES

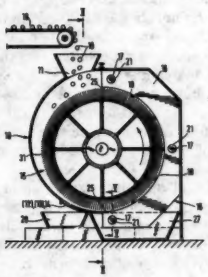
Fritz Lange, Lindenallee 21, 2355 Schonboken, Fed. Rep. of Germany

Filed Sep. 5, 1984, Ser. No. 647,672

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332048

Int. Cl.[4] A23N *7/00*

U.S. Cl. 99—626 **12 Claims**



1. An apparatus for cleaning fruits and vegetables, comprising:

(a) a substantially closed housing having feed and discharge openings for said fruits and vegetables;

(b) a conveyor drum rotatable in said housing and having brush-like elements disposed on its circumference;

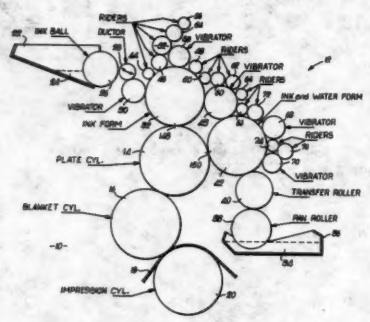
(c) a multiplicity of stationary abrasive elements arranged in said housing generally opposite to said brush-like elements along at least a portion of the rotary path thereof and disposed to cooperate with said brush-like elements to abrade and clean fruit and vegetables fed therepast and therebetween by said brush-like elements; and

(d) a multiplicity of guide and abrasive strips disposed in said housing generally opposite to said brush-like elements and oriented to guide fruit and vegetables fed into said housing through said feed opening generally past said abrasive elements and toward said discharge openings, said strips also serving to abrade and clean fruit and vegetables fed therepast.

4,621,574
DUAL FORM PLANETARY INKER

Terry N. Faddis; Howard L. Propheter, and Thomas D. Parks, all of Emporia, Kans., assignors to Didde Graphic Systems Corporation, Emporia, Kans.

Filed Apr. 5, 1985, Ser. No. 720,364
Int. Cl.[4] B41F 7/04, 31/14
U.S. Cl. 101—142 3 Claims



1. In an offset printing press having a blanket cylinder, a plate cylinder disposed to rotate in rolling contact with said blanket cylinder, a source of dampening solution, and an ink fountain, the combination therewith of a dual form planetary inker comprising:

a pair of side-by-side form rollers out of engagement with one another and each disposed for rolling engagement with said plate cylinder to each form a nip with said plate cylinder,

the rotational axis of one of said form rollers being fixed relative to the rotational axis of the other;

gear means interconnecting said form rollers with said plate cylinder and being operable to rotate said form rollers at essentially the same surface velocity as the surface velocity of said plate cylinder;

a series of distributor rollers, a certain quantity of said distributor rollers being positioned for rolling contact with one of said form rollers and a certain other number of said distributor rollers being disposed for rolling engagement with the other of said form rollers,

at least one of said quantity of distributor rollers being a longitudinally oscillatable roller in contact with one of said form rollers and at least one of said number of distributor rollers being a longitudinally oscillatable roller in contact with the other of said form rollers,

one of said distributor rollers being operably associated with said ink fountain and functioning as a supply roller for delivering ink to one of the form rollers for delivery to the plate cylinder at a controlled rate,

said dampening solution source being operably associated with one of said form rollers for dampening non-image areas of said plate cylinder and thus preclude deposition of ink thereon ;and

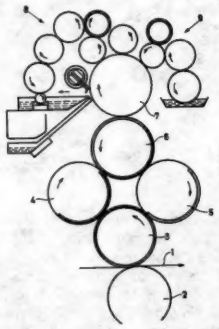
ink transfer roller means in continuous bridging rolling engagement with both of said form rollers for also transferring ink to the plate cylinder along a path from the form roller in engagement with said ink supply roller via the ink transfer roller means and the other form roller direct to the plate cylinder, said ink transfer roller means including at least one longitudinally oscillatable vibrator roller having an axis of rotation fixed relative to the rotational axes of said form rollers,

whereby two separate, continuous pathways for transfer of ink to the plate cylinder are presented during operation of the press for printing, with both of the form rollers being continuously supplied with ink that is constantly smoothed by said distributor rollers before subsequent transfer to said plate cylinder at each of the form roller nips thereon.

4,621,575
PRINTING UNIT OF AN OFFSET ROTARY PRINTING MACHINE

Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,686
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412783
Int. Cl.[4] B41F 7/02
U.S. Cl. 101—217 3 Claims



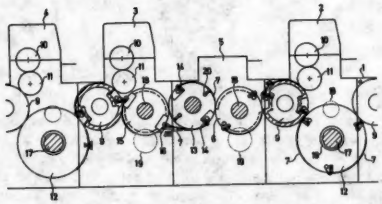
1. Printing unit of an offset rotary printing machine for printing a paper web with an endless impression, the printing unit having two plate cylinders with respective printing plates disposed on half the respective peripheries thereof for providing respective partial prints successively, comprising at least one blanket cylinder operatively associated with the two plate cylinders and having an outer cylindrical surface in rolling contact therewith, an applicating roller equal in size to that of the plate cylinder and disposed for simultaneous engagement with both of the plate cylinders, an inking unit and a dampening unit operatively connectible via an inking cylinder with both of the plate cylinders for delivering ink and dampening fluid thereto, a sum of distances, as viewed in direction of the two plate cylinders, starting from a contact location between said blanket cylinder and an impression cylinder, at which successive partial prints provided by the two plate cylinders become united and extending via the outer cylindrical surface of said blanket cylinder to a contact location between said blanket cylinder and one of said plate cylinders, extending via the outer cylindrical surfaces of said one plate cylinder to a contact location between said one plate cylinder and said applicating roller, extending via the outer cylindrical surface of said applicating roller to a contact location between said applicating roller and the other of said plate cylinders, extending via the outer cylindrical surface of said other plate cylinder to a contact location between said other plate cylinder and said blanket cylinder and extending via the outer cylindrical surface of said blanket cylinder back to said contact location between said blanket and impression cylinders, being equal to a multiple of the periphery of one of the two plate cylinders.

4,621,576

SHEET-FED ROTARY PRINTING PRESSES FOR SINGLE-SIDE PRINTING OR FIRST FORM AND PERFECTOR PRINTING

Arno Wirz, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,853
Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418443
Int. Cl.[4] B41F *13/44*
U.S. Cl. 101—230 3 Claims



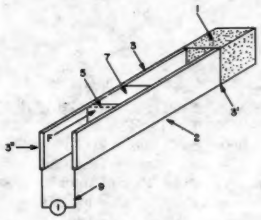
1. Sheet-fed rotary printing press for single-side multicolor printing or for first form and perfector printing comprising a plurality of printing units disposed in tandem and having devices for processing both paper as well as heavier paper-board, each of the plurality of printing units having a plate cylinder and a blanket cylinder of equal given diameter in mutually cooperative relationship as well as an impression cylinder operatively engaging the blanket cylinder and having a diameter double the given diameter, and a sheet transfer cylinder in mutually cooperative relationship with the impression cylinder, each of the printing units comprising an upper part and a lower part, said lower part thereof having two opposite side walls each formed with two bearing holes, respectively, located vertically above one another for alternatively receiving therein respective bearings for sheet transfer cylinders, the lower of said two vertically disposed bearing holes being of such size as to accommodate a bearing for a journal of a sheet transfer cylinder having a diameter triple that of said given diameter, and the upper of said bearing holes being of such size as to accommodate a bearing for a journal of a sheet transfer cylinder having a diameter, double that of said given diameter and another printing unit formed exclusively of said lower part and being disposed between a given one of the plurality of printing units located downstream therefrom in travel direction of a sheet through the printing press and another of the plurality of printing units located upstream therefrom and carrying a storage cylinder having a diameter double that of the given diameter at a location thereof normally occupied by the impression cylinder, said last-mentioned printing-unit lower part also having a double-diameter sheet transfer cylinder journalled in said upper bearing hole thereof, the sheet transfer cylinder in said other of the plurality of printing units located upstream of said last-mentioned printing-unit lower part being a sheet turnover cylinder having two tongs-gripper systems mounted thereon mutually offset circumferentially by 180°.

4,621,577

MINIATURE PLASMA ACCELERATING DETONATOR AND METHOD OF DETONATING INSENSITIVE MATERIALS

Robert W. Bickes, Jr.; Michael R. Kopczewski, and Alfred C. Schwarz, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jan. 4, 1985, Ser. No. 688,672
Int. Cl.[4] F42B *3/14*
U.S. Cl. 102—200 16 Claims



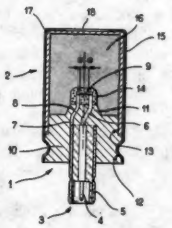
1. In a detonator assembly for initating insensitive explosives or energetic materials, the improvement wherein said detonator assembly comprises: railgun accelerating means of a size sufficient to be used as a detonator for insensitive explosives or energetic materials in an amount of about 100 mg of explosives or less and capable of accelerating a plasma to detonation intiating velocities; and power supply means for supplying the power necessary to said railgun accelerating means to generate and accelerate said plasma.

4,621,578

PYROTECHNIC INITIATOR USING A COAXIAL CONNECTOR

Yves Vallieres, Vert le Petit, and Georges Granier, Viry-Chatillon, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 13, 1984, Ser. No. 681,011
Claims priority, application France, Dec. 28, 1983, 83 20906
Int. Cl.[4] F42C *19/12*
U.S. Cl. 102—202.9 16 Claims



1. A pyrotechnic initiator comprising an igniter (1,31), said igniter comprising a coaxial connector (3,33), said coaxial connector comprising a central electric conductor (4,34), a peripheral electric conductor (5,35) coaxial with said central conductor, said igniter having an outer surface, said coaxial connector having a modified end zone, electric insulating means positioned between the central electric conductor and the peripheral electric conductor and positioned between said peripheral conductor and said outer surface of said igniter, said electric insulating means comprising a common dielectric mass (10,40), at least one resistance element (9,39) connected to said central electric conductor and to said peripheral conductor,

said end zone of said coaxial connector being connected to said resistance element a pyrotechnic substance surrounding said resistance element and said end zone of said coaxial connector.

4,621,579

DEVICE FOR PRODUCING A DECOY CLOUD, IN PARTICULAR AN INFRARED DECOY CLOUD

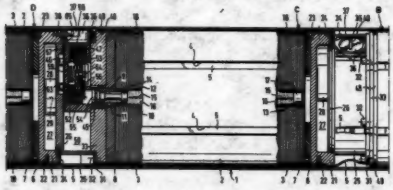
Wolfgang Badura, Bad Reichenhall; Gerhard Grau, Muellheim/-Baden; Axel Widera, Ainring/Obb., and Kurt Adamek, Bischofswiesen, all of Fed. Rep. of Germany, assignors to Buck Chemisch-Technische Werke GmbH & Co., Bad Uberkingen, Fed. Rep. of Germany

Filed Jun. 12, 1985, Ser. No. 743,949

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421708

Int. Cl.[4] F42B *13/44*

U.S. Cl. 102—334 **19 Claims**



1. A projectile assembly for producing a decoy cloud comprising:

(a) a launcher tube having an upper exit end and a lower base end;

(b) a multiplicity of projectiles disposed witin said launcher tube and each comprising a casing providing a chamber, decoy material within said chamber, an ignitable disintegrator component for effecting disintegration of said casing and scattering of said decoy material, an ejection chamber in the base of said casing, propellant means in said ejection chamber for ejecting said projectile from said exit end of said launcher tube, fuse means adapted to ignite said ignitable disintegrator component, and mechanically releasable safety means for preventing operation of said fuse means; and

(c) control means in said launcher tube for actuation of said fuse means to effect ignition of said ignitable disintegrator component subsequent to discharge of said projectiles from said launcher tube, said safety means of said projectile assemblies being released upon launching of the projectile from said launcher tube and in response to acceleration of said projectile upon such lauching, said control means also effecting ignition of said propellant means in said ejection chamber to discharge said projectles sequentially from said launcher tube, whereby said projectiles are launched in predetermined time-spaced relationship from said launcher tube as they proceed along a trajectory defined thereby to scatter said decoy material and produce a cloud thereof which extends in the path of said trajectory.

4,621,580

PROCESS OF MANUFACTURING A COLORED SMOKE-GENERATING ARRANGEMENT

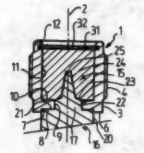
André Castera, Creuzier Le Vie; Jacques Nicolas, Cheix Sur Morge, and Jean Buvat, Chantelle, all of France, assignors to Manufacture de Machines du Haut-Rhin, S.A., Mulhouse, France

Filed Oct. 14, 1982, Ser. No. 434,232

Claims priority, application France, Oct. 14, 1981, 81 19317

Int. Cl.[4] F42B *13/44*

U.S. Cl. 102—334 **17 Claims**



1. A process for manufacturing a smoke producing arrangement which generates a trace of smoke of a predetermined distinctive color, and which is particularly adapted to be used in conjunction with a spin-stabilized projectile such as a signal or distress flare projectile, said projectile including a rigid housing which is fluid-tight and which has an opening forming a nozzle which is oriented along an average predetermined direction opposite to the direction of flight of the projectile, the smoke producing composition being the combination of an organic sublimable coloring medium and a pyrotechnic oxidizing support carrier composition the combustion of which is adapted to cause the sublimation of the coloring medium, comprising forming the smoke producing composition by mixing, in a pulverulent state, a sublimable organic coloring medium and a pyrotechnic carrier composition, and distributing the coloring medium between the particles of the carrier composition in such a way that the mixture has an average specific gravity of about 1; the composition so obtained placing this mixture into the housing of a projectile having a nozzle; and by variably compressing it into the interior of the housing so that a charge having an appropriate texture for a rapid sublimation of the coloring medium is obtained and which charge is least compressed in the vicinity of the nozzle.

4,621,581

ARTICLE MOVING SYSTEM WITH DRIVE ARMS AND GUIDE CHANNELS

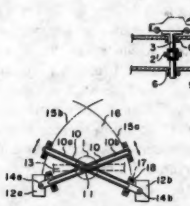
Yoshitane Kurimoto, 4-14 Ichikawa Minami 4-chome, Ichikawa-shi, Chiba-ken, Japan

Filed Mar. 1, 1985, Ser. No. 707,313

Claims priority, application Japan, Mar. 2, 1984, 59-39787

Int. Cl.[4] B60K *7/00*; B60P *9/00*; B61C *11/00*; G05G *11/00*

U.S. Cl. 104—140 **1 Claim**



1. A means for moving articles along a predetermined path at a desired speed comprising;

an article support rod;

a first plate and a second plate,

said first plate spaced in a parallel plane from said second plate;

first and second guide channels formed in a desired configuration in said first and second plates respectively;

said first guide channel configuration being vertically aligned with said second channel configuration;

said article support rod being positioned in each of said first and second guide channels in a plane perpendicular to said plates and moved by drive means along said guide channels;

said drive means comprising first and second drive arms, said first and second drive arms each having an elongated slot, and each being pivotally secured at one end thereof and driven by motor means for movement in intersecting arcs, said arms thereby intersecting to form a common opening therebetween; said article support rod being inserted in said common opening, whereby movement of said first and second drive arms in their respective arcs drive said article support rod in said guide channels;

switch means located at desired locations along said channels for effecting a change of direction of said article support rod within said guide channels; and

said article support rod being mounted on a caster wheel assembly for support thereof while maintaining ease of movement.

4,621,582

COAL BURNER

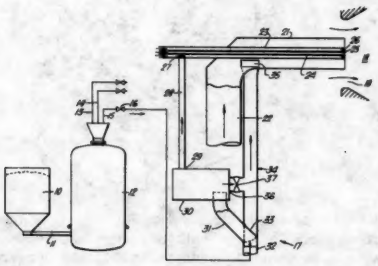
James Cooper, Glasgow, Scotland, assignor to James Howden & Company Ltd., Glasgow, Scotland

Filed Mar. 12, 1985, Ser. No. 710,990

Claims priority, application European Pat. Off., Mar. 13, 1984, 84301708.8

Int. Cl.[4] F23D *1/02*

U.S. Cl. 110—264 **8 Claims**



1. A coal burner comprising:

(a) a combustion chamber;

(b) a main nozzle;

(c) means for feeding particulate coal to said main nozzle;

(d) a primary air supply opening into said combustion chamber around said main mozzle;

(e) a pilot nozzle mounted generally centrally within the main nozzle and having an outlet adjacent the outlet of the main nozzle;

(f) a separate feed line for feeding a mixture of ultrafine pulverized coal and inert gaseous fluid to said pilot nozzle;

(g) a centrifugal separator in said feed line at a location thereof upstream of, and spaced from said burner, effective to increase the concentration of ultrafine coal to gaseous medium in said mixture, which is fed to said pilot nozzle.

4,621,583

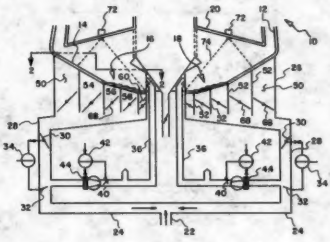
SYSTEM FOR CONTROLLING A BARK-FIRED BOILER

Kalevi M. Kaski, Klaukkala, Finland, assignor to Measurex Corporation, Cupertino, Calif.

Filed Jun. 28, 1985, Ser. No. 750,341

Int. Cl.[4] F23D *1/00*; F22D *37/42*

U.S. Cl. 110—346 **6 Claims**



1. A system for controlling a boiler which burns solid fuel and which has a reciprocable grate, means for feeding solid fuel onto the grate to be burned, and means to controllably introduce air under the grate, the system comprising:

(a) light sensing means mounted above the grate and located to receive light from the solid fuel on the grate;

(b) control means coupled to receive signals from said light sensing means to determine, based upon the signals, the location of at least one crater in the solid fuel on said grate, and to generate signals indicative of the determined locations; and

(c) actuator means, coupled to receive the signals indicative of the determined location from said control means, to vary an operating parameter of the furnace according to the determined location of the at least one crater in the solid fuel on said grate.

4,621,584

METHOD AND DEVICE FOR FIRING SOLID FUELS, MAINLY IN THE FORM OF LUMPS OR PIECES

Frank E. W. Asplund, Dalbovägen 15, Sollentuna S-191 45, and Ulrika M. Jantze, Gotlandsgatan 74, Stockholm S-116 38, both of Sweden

PCT No. PCT/SE84/00342, § 371 Date Jun. 24, 1985, § 102(e) Date Jun. 24, 1985, PCT Pub. No. WO85/02007, PCT Pub. Date May 9, 1985

PCT Filed Oct. 17, 1984, Ser. No. 752,340

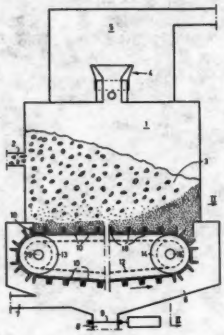
Claims priority, application Sweden, Oct. 24, 1983, 8302684

Int. Cl.[4] F23D *1/00*

U.S. Cl. 110—347 **2 Claims**

1. A device for carrying out a method for firing solid fuels, in the form of particles in a furnace having a subsantially horizontal bottom, upon which is maintained a fuel bed with relatively great thickness while supplying fuel within the fuel bed, through which primary combustion air is fed from below through the combustion chamber bottom, which consists of a plurality of mutually substantially parallel beams, which extend over the whole width of the combustion chamber and which are mutually spaced so as to form gaps therebetween, said combustion chamber in its upper portion furthermore having an orifice for admixing secondary air to the combustion gas leaving the combustion chamber in order to carry out a subsequent secondary combustion in a secondary combustion chamber, wherein the fuel supply inlet is located at a position on an end wall of the combustion chamber at a vertical height spaced above the bottom of the latter but below the upper surface of the fuel bed during the furnace operation and adapted to supply fuel positively and intermittently and substantially in a horizontal direction, and in that the beams are

arranged horizontally movable in parallel by associated endless conveying means driven by a drive device in order to provide



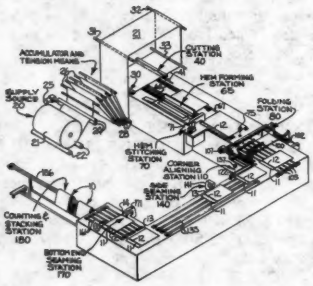
for a mechanical ash removal during the operation of the furnace.

4,621,585

APPARATUS FOR FABRICATING PILLOWCASES

Gregory A. Ball, Mooresville; Byron E. Moore, Kannapolis, and Hoyt W. Beam, Concord, all of N.C., assignors to Cannon Mills Company, Kannapolis, N.C.

Filed Sep. 16, 1985, Ser. No. 776,651
Int. Cl.[4] D05B *13/00*
U.S. Cl. 112—10 **14 Claims**



1. An apparatus for successively fabricating pillowcases and the like comprising

a supply source of continuous open width textile fabric with side edges along opposite sides thereof,

means for successively withdrawing predetermined lengths of the textile fabric from said supply source and along a first path of travel in a lengthwise direction,

a cutting station positioned in the longitudinal path of travel of the withdrawn predetermined lengths of textile fabric and including cutting means for transversely cutting the textile fabric into successive individual blanks of predetermined length,

a hem folding station including means for receiving the individual blank and folding one cut end portion of the individual blanks over onto the remaining portion thereof,

a hem stitching station including means for receiving the folded over end hem portion and sewing the hem,

conveying means for successively moving the individual blanks along a horizontal second path of travel in a widthwise direction from said cutting station, through said hem folding station, and through said hem stitching station to form a hem along one end of the individual blank and extending between opposite side edges thereof,

a folding station including means for successively receiving the hemmed blanks from said hem stitching station and folding the blanks along a fold line extending longitudinally along the medial portion of the blank with the opposite side edges and the hemmed end in substantial overlying alignment with one another,

a corner aligning station including means for detecting an out of alignment condition of the leading ends of the hemmed end and overlying opposite side edges, for selectively advancing the upper and lower hemmed ends and overlying opposite side edges, and for aligning the leading ends thereof,

a side seaming station including means for receiving the aligned side edges and sewing together the leading folded hem portions and the trailing side edges,

conveying means for successively moving the individual blanks along a third horizontal path of travel in a lengthwise direction and from said folding station, through said corner aligning station, and through said side seaming station,

a bottom end seaming station including means for receiving and sewing together the overlying bottom ends of the successive blanks, and

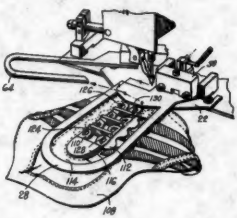
conveying means for successively moving the individual blanks along a fourth horizontal path of travel in a widthwise direction through and beyond said bottom end seaming station.

4,621,586

WORKPIECE HOLDING DEVICE

Hans Binder, Vienna, Austria, assignor to USM Corporation, Farmington, Conn.

Filed May 6, 1985, Ser. No. 731,169
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 **14 Claims**



1. A workpiece holding device for holding a number of separate pieces of work with respect to each other during sewing by an automatic sewing machine, said workpiece holding device comprising;

means for registering a base piece of the work in a predetermined position;

means for clamping the base piece of work to said registration means;

means, located on said registering means, for orienting at least one further piece of work relative to the base piece after the base piece of work has been clamped;

means for contacting the oriented one or more pieces of work in a predetermined area while the pieces are being partially sewn to the base piece; and

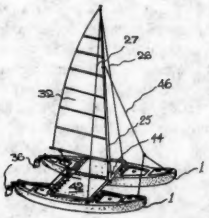
means for automatically moving said contacting means from a position of contact with the oriented one or more pieces of work to a remote location of no contact with the oriented one or more pieces of work after the pieces have been partially sewn to the base piece so as to allow sewing to continue in the predetermined area previously contacted by said contacting means.

4,621,587

BOAT CONSTRUCTION

Peter J. Pool, 5 Ulladulla Place, Kareela, Sydney, N.S.W., 2232, Australia

Filed Nov. 1, 1984, Ser. No. 667,009
Claims priority, application Australia, Nov. 1, 1983, 2138/83
Int. Cl.[4] B63H 9/06
U.S. Cl. 114—61 7 Claims



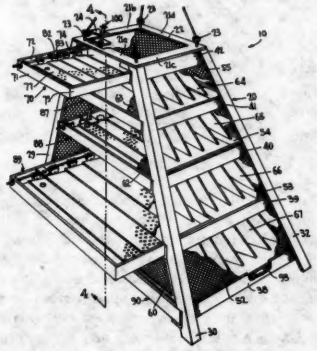
1. A demountable catamaran comprising a first kayak-type canoe hull, a second kayak-type canoe hull, a trampoline adapted to removably span and maintain said hulls spaced apart; each said hull having a spaced-apart pair of cockpits arranged in tandem; each said hull including a pair of tabernacles, one located forward of and the other located aft of said tandem cockpits, each said tabernacle being adapted to removably receive therein an elongated spigot component, substantially normally to the water-line of said hull; said trampoline having a rectangular frame provided with four depending, elongated spigot components each adapted to be removably received in a respective one said tabernacle, a further tabernacle mounted upon a forward cross-member of said trampoline frame; a mast, the butt end of which is removably receivable in either said further tabernacle or a forward one said tabernacle of said hull; and a sail for said mast.

4,621,588

SHELLFISH CULTIVATOR

Sherwood Harris, The Glen, R.R. #3, Katonah, N.Y. 10536

Filed Dec. 20, 1985, Ser. No. 811,427
Int. Cl.[4] A01K 61/00
U.S. Cl. 119—4 20 Claims



1. A shellfish cultivator which comprises

a housing which has a front side, a left side, a right side and a rear side and which includes a top frame member, a plurality of leg members which extend downwardly from said top frame member; a plurality of horizontal brace members which extend between said leg members and which provide a plurality of horizontal slideways which extend from the front side to the rear side of said housing, said plurality of horizontal slideways including at least one upper slideway and a lowermost slideway; and a plurality of screen sections which extend between said leg members and which cover the front side, the left side, the right side and rear side of said housing between said slideways,

a respective drop drawer slidably positioned in each upper slideway, each drop drawer including a front wall, a left side wall, a right side wall, a rear wall and a floor which includes a plurality of perforated louvers which are rotatable to open or close the floor, and

a bottom receiving drawer slidably positioned in said lowermost slideway, said bottom receiving drawer including a front wall, a left side wall, a right side wall, a rear wall and a continuous, flat floor, each said drop drawer and said bottom receiving drawer being insertable between adjacent screen sections extending between leg members on the front side of said housing.

4,621,589

CHILD SECURITY DEVICE

Thomas A. Thinnes, 7726 N. Fourth Ave., Phoenix, Ariz. 85020

Filed Mar. 22, 1985, Ser. No. 714,884
Int. Cl.[4] A01K 27/00
U.S. Cl. 119—96 7 Claims

1. A security restraint for use with a conventional shopping cart having a frame mounted on wheels with the frame including a generally vertical frame member, said restraint comprising:

(a) a tether having opposite first and second ends;

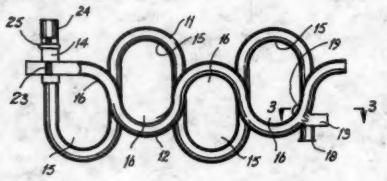
(b) reel means receiving the first end of said tether for paying out and rewinding said tether, said reel means having mounting means for detachable securement to said frame member at a predetermined height, said reel means including locking means for securing said reel means at a predetermined position for paying out a predetermined length of tether;

(c) harness means secured to the said second end of said tether with releasable locking means for securing said harness about said child whereby the reel means may be secured to the shopping cart frame member at a height commensurate with the height of the child and whereby said tether may be payed out a predetermined distance with the restraint means locked about the child thereby restraining the child from wandering beyond a predetermined distance from the cart.

4,621,590
LIVESTOCK LEG RESTRAINER

Neil W. Curwen, RMB 997, Via Mt. Barker, Western Australia, Australia

PCT No. PCT/AU84/00255, § 371 Date Jul. 25, 1985, § 102(e) Date Jul. 25, 1985, PCT Pub. No. WO85/02534, PCT Pub. Date Jun. 20, 1985
PCT Filed Dec. 6, 1984, Ser. No. 768,482
Claims priority, application Australia, Dec. 6, 1983, PG2705; Mar. 2, 1984, PG3896; Aug. 2, 1984, PG6338; Aug. 13, 1984, PG6537; Sep. 18, 1984, PG7196
Int. Cl.[4] A01K *15/04*
U.S. Cl. 119—128 7 Claims

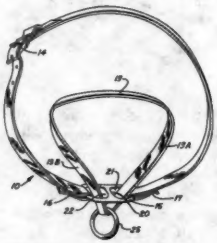


1. A livestock leg restraining means comprising a first member formed with a set of at least two open ended oppositely facing, adjacent recesses located in side by side relationship and second member pivotally connected to one end of the first member and movable to a first position closing each recess and a second position opening each recess to receive the legs of an animal, and retaining means for selectively locking the first and second members when the second member is in the closed position.

4,621,591
COMBINATION COLLAR AND MUZZLE HUMANE TRAINING AID

Robert K. Anderson, Roseville; Ruth E. Foster, Minneapolis, and Jeffrey A. Levine, Bloomington, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 4, 1985, Ser. No. 719,697
Int. Cl.[4] A01K *25/00*
U.S. Cl. 119—130 7 Claims



1. A combination collar and muzzle humane training aid for dogs, comprising:

a first adjustable collar loop adapted to fit around the neck of a dog immediately behind the head of such dog and adjustable to snugly fit to prevent its slipping downwardly on the neck from its position immediately behind the head;

a first divided ring carried by said collar loop and having a center divider bar forming ring end portions, opposite ends of said collar loop being attached to the respective ring end portions to form collar side straps with said first ring forming a part of said collar loop, the first ring being positioned underneath the neck and immediately to the rear of the lower jaw of a dog on which the training aid is placed and resting flat against the throat of such dog when the collar loop is in place and adjusted;

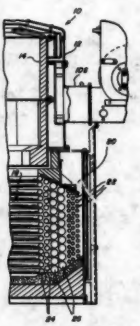
a second muzzle loop passing through said first ring with a separate side of the muzzle loop positioned on each of the respective sides of the divider bar of the first ring and freely sliding relative to said first ring, said muzzle loop having a first loop portion extending from the first ring of size to encompass the muzzle and at least a portion of the lower jaw of a dog on which the training aid is to be used, and said muzzle loop having a second loop portion extending to the opposite side of said first ring from the first loop portion of the muzzle loop; and

the second loop portion of the muzzle loop being positioned on the underside of the first ring and below the lower jaw of a dog on which the training aid is to be used, whereby a leash may be attached to the second loop portion to provide a pulling force on the muzzle loop to tighten the muzzle loop and thereby through the first ring to simultaneously exert a force on the collar loop when the training aid is installed on a dog, to provide simultaneous pressure on both the collar loop and muzzle loop in directions toward the first ring in its position underneath and immediately to the rear of the lower jaw of a dog on which the training aid is mounted.

4,621,592
BOILER HAVING IMPROVED HEAT ABSORPTION

Michael J. McInerney, Highland Park, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Nov. 29, 1984, Ser. No. 676,012
Int. Cl.[4] F22B *21/26*
U.S. Cl. 122—250 R 8 Claims



1. A method of improving boiler efficiency wherein said boiler includes a casing, a heating chamber defined in said casing, a flue in communication with said heating chamber, a bank of coils connected in series surrounding said heating chamber concentric with a vertical axis extending through said boiler, said bank of coils including an inner coil surrounding said heating chamber, an intermediate coil surrounding said inner coil, and an outer coil surrounding said intermediate coil, the method comprising the steps of:

introducing fluid into said outer coil,

communicating said fluid from said outer coil to said inner coil,

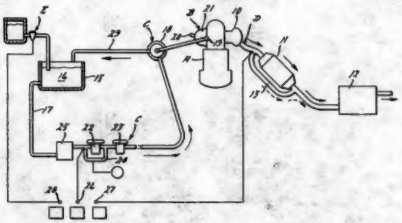
communicating said fluid from said inner coil to said intermediate coil, and

communicating said fluid from said intermediate coil to an outlet.

4,621,593
AUTOMOTIVE DISPENSING APPARATUS FOR FUEL ADDITIVE

Vemulapalli D. N. Rao, Bloomfield Township, Oakland County, and Wallace R. Wade, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1984, Ser. No. 685,927
Int. Cl.[4] F02B 75/12
U.S. Cl. 123—1 A **9 Claims**



1. An automotive on-board dispensing apparatus for a fluid agent that is effective in depressing the ignition temperature of carbon, said agent being added to the fuel tank of a fuel delivery system for an automotive engine, said fuel tank being replenished by independent separate apparatus normally used to refill tanks after fuel consumption, which engine has an exhaust system comprising a particulate carbon trap, the apparatus comprising:

(a) a reservoir for containing a supply of said fluid agent is comprised of a liquid mixture of an aerosol promoting liquid and a metal octoate or octoate complex;

(b) electrically operated pump means for positively displacing a measured amount of said agent from said reservoir into said fuel supply;

(c) register means in said tank for registering the amount of fuel replenished to said engine fuel tank after each refill and for transmitting an electrical signal proportional to the amount of fuel so added; and

(d) control means responsive to said electrical signal to permit electrical operation of said pump means for a period of time to dispense a predetermined amount of said agent directly to said replenished fuel supply for maintaining a desired uniform concentration of said agent throughout said fuel supply.

4,621,594
SINGLE-CIRCUIT COOLING SYSTEM FOR INTERCOOLED MARINE ENGINES

Heribert Kubis, Nuremberg, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

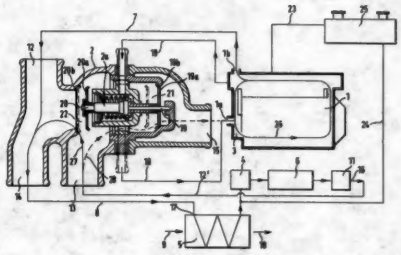
Filed Sep. 11, 1985, Ser. No. 774,640
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433319
Int. Cl.[4] F01P 7/16
U.S. Cl. 123—41.09 **9 Claims**

1. A cooling system which includes a common cooling circuit which is provided with coolant for cooling an internal combustion engine and charge air for said engine, wherein said coolant is discharged from said engine, with said discharged coolant being controlled by means of a thermostat, and with said discharged coolant being returned to a cooling jacket which is provided on said engine, the improvement comprising:

a single four-way thermostat which is provided with two inlets, two outlets, and a thermostat element, as a control element, which is continuously and directly exposed to said coolant from said cooling jacket of said engine;

a first coolant pump which circulates said coolant in a straight bypass mode which bypasses said common cooling circuit when said thermostat occupies a closed position during warm-up of said engine; and

a second coolant pump which circulates said coolant in a straight bypass mode which bypasses said thermostat when said thermostat is in a closed position, said second coolant pump furthermore circulates said coolant through

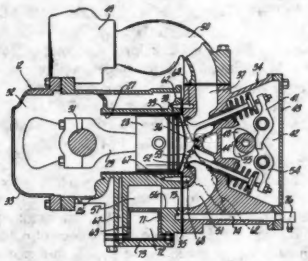


said common cooling circuit which includes, successively arranged, a skin cooler and at least one charge air cooler; after said warm-up of said engine, said thermostat occupies an open position, with approximately one quarter of the total amount of coolant being circulated through said common cooling circuit.

4,621,595
WATER-COOLED FOUR-CYCLE INTERNAL COMBUSTION ENGINE FOR OUTBOARD MOTORS

Tomonori Suzuki, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Aug. 23, 1984, Ser. No. 643,647
Claims priority, application Japan, Aug. 25, 1983, 58-154174
Int. Cl.[4] F01P 3/12
U.S. Cl. 123—41.72 **12 Claims**

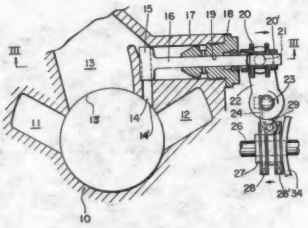


1. In a water-cooled internal combustion engine having a cylinder block, a cylinder head affixed to said cylinder block and forming a combustion chamber therewith, said cylinder head having a surface engaged with a corresponding surface of said cylinder block, a cooling jacket formed in said cylinder head and said cylinder block, an exhaust passage extending through said cylinder head from said combustion chamber through said cylinder head surface and said cylinder block for discharge of exhaust gases from said engine, said cooling jacket being positioned at least in part adjacent and in direct heat exchanging relation with said exhaust passage on one side thereof and adjacent said cylinder head surface, the improvement comprising an additional cooling jacket in proximity at least in part to the portion of said exhaust passage formed in said cylinder head and in direct heat exchanging relation therewith on the other side of said cylinder head surface.

4,621,596
EXHAUST CONTROL SYSTEM

Eizaburo Uchinishi, Hyogo, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Oct. 30, 1984, Ser. No. 666,305
Claims priority, application Japan, Nov. 2, 1983, 58-206379
Int. Cl.[4] F02D *39/04*
U.S. Cl. 123—65 PE 8 Claims



1. An exhaust control system for a 2-cycle engine having at least one combustion cylinder with a longitudinal axis comprising:

a main exhaust passage communicating with said cylinder through a main exhaust port;

an exhaust sub-passage communicating with said cylinder through an exhaust sub-port, said sub-port located laterally of and in spaced relationship to said main exhaust port, said exhaust sub-port and said main exhaust port lying in a common plane arranged perpendicular to said longitidinal axis; and

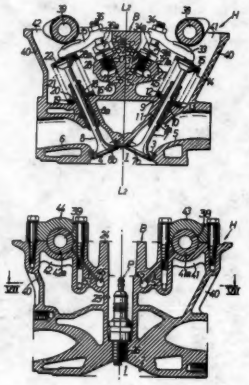
controlling means for varying the degree of opening of said sub-passage in accordance with engine speed whereby timing of opening and closing of said exhaust ports is not altered due to opening and closing of said exhaust sub-port.

4,621,597
CYLINDER HEAD FOR DOUBLE OVERHEAD CAM ENGINE

Keiichi Kawada, Saitama; Takahiro Okuyama, Tokyo, and Susumu Toki, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,338
Claims priority, application Japan, Oct. 4, 1983, 58-185249
Int. Cl.[4] F01L *1/04;* F01M *1/06*
U.S. Cl. 123—90.27 5 Claims

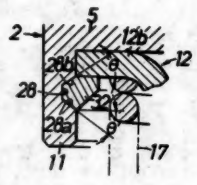
1. A cylinder head for a DOHC type four-cycle internal combustion engine that for each cylinder of a plurality of cylinders has a combustion chamber with intake and exhaust valve ports opened therein, intake and exhaust ports communicating with said valve ports, valve supporting portions supporting in a slidable manner, the intake and exhaust valves for opening said intake and exhaust valve ports, said cylinder head having a predetermined length substantially that of said engine along its longitudinal axis, and bearing portions rotatably supporting two camshafts of valve actuating mechanisms for opening and closing said intake and exhaust valves, the improvement comprising, a center block integrally formed in the cylinder head to extend the entire length of the cylinder head above each said combustion chamber and located between the bearing portions for the intake and exhaust camshafts, said center block formed in its center axis with a plug fitting cylinder for receiving an ignition plug at each engine cylinder, said center block formed with intake and exhaust rocker arm bearing support portions on both lateral sides of said plug fitting cylinder, a pair of main oil supply passages formed in the longitudinal direction of the engine crankshaft on both lateral sides of said plug fitting cylinder, and means formed in said center block communicating each said main oil supply passage with said rocker arm bearing support portions and camshaft bearing portions on that lateral side for lubricating said rocker arm bearing portions and camshaft bearing portions, said camshaft bearing portions being integrally formed with and connected to each center block along a top surface thereof.



4,621,598
HYDRAULIC LASH ADJUSTOR IN A VALVE OPERATING MECHANISM

Seishi Miura, Shiki, Japan, assignor to Nittan Valve Co., Ltd. and Honda Giken Kogyo Kabushiki Kaiska, both of Tokyo, Japan

Filed Aug. 25, 1983, Ser. No. 526,452
Claims priority, application Japan, Aug. 26, 1982, 57-148106
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.[4] F01L *1/24*
U.S. Cl. 123—90.46 5 Claims



1. In an improved hydraulic lash adjustor in a valve operating mechanism of the type including a cylinder, a plunger slidably fitted into said cylinder, a hydraulic chamber defined between both the cylinder and the plunger, a hydraulic oil reservoir chamber formed in the plunger, said hydraulic oil reservoir chamber being communicated with the hydraulic chamber by way of a valve bore which is formed through a bottom portion provided on a lower side of said plunger, a check valve mounted on said valve bore so as to open when hydraulic pressure in the hydraulic chamber decreases and close when it increases, a valve cage secured to the plunger to accommodate therein said check valve, a cylindrical portion extending downwardly from the bottom portion of said plunger, an annular engagement groove formed around the inner peripheral surface of said cylindrical portion, and a resilient member adapted to bias said plunger so as to project outwardly of the cylinder, wherein said valve cage comprises a cap-shaped main body and a flange portion integrally extending radially outward from the peripheral end part of said main

body, said flange portion being firmly held in place between the bottom portion, of the plunger, and a caulking ring fitted into said annular engagement groove, the improvement wherein a lower side wall surface of the annular engagement groove is formed as a tapered face descending radially inwardly.

4,621,599

METHOD AND APPARATUS FOR OPERATING DIRECT INJECTION TYPE INTERNAL COMBUSTION ENGINE

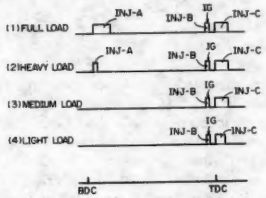
Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio; Toru Yoshinaga, and Yasuhiro Takeuchi, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 10, 1984, Ser. No. 680,045

Claims priority, application Japan, Dec. 13, 1983, 58-233555; Feb. 8, 1984, 59-22372

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—300 **10 Claims**



1. A method for operating an internal combustion engine having a fuel injection valve for injecting fuel into a cylinder, a spark plug arranged adjacent to said fuel injection valve for carrying out ignition in said cylinder, an ignition coil connected to said spark plug, and an igniter connected to said ignition coil, said method comprising the steps of:

carrying out a prior main fuel injection (INJ-A) during heavy and full engine load conditions in the vicinity of or preceding the bottom dead center of the compression stroke;

carrying out an auxiliary fuel injection (INJ-B) in the vicinity of the top dead center of the compression stroke;

carrying out a subsequent main fuel injection (INJ-C) after said auxiliary fuel injection is terminated; and

carrying out the ignition of the spray produced by said auxiliary fuel injection (INJ-B) by said spark plug concurrently with said subsequent main fuel injection (INJ-C).

4,621,600

FUEL SUPPLY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES AT FUEL CUT OPERATION

Shumpei Hasegawa, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

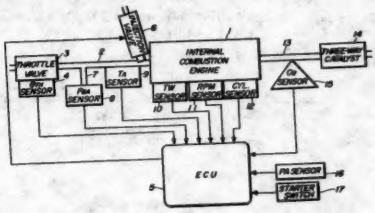
Continuation of Ser. No. 521,612, Aug. 8, 1983, abandoned. This application Sep. 4, 1985, Ser. No. 773,097

Claims priority, application Japan, Aug. 18, 1982, 57-143010

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—357 **6 Claims**

1. A method for electronically controlling the quantity of fuel being supplied through injection to an internal combustion engine in synchronism with generation of pulses of a predetermined control signal, in response to operating conditions of said engine, said engine having an exhaust passage and a catalyst device arranged in said exhaust passage for purifying exhaust gases, the method comprising the steps of: (a) setting beforehand a predetermined fuel cut condition for cutting off the supply of fuel to said engine during deceleration, on the basis of the maximum allowable bed temperature of said catalyst device which is a function of the rotational speed of said engine and a predetermined parameter indicative of load on said engine; (b) detecting the rotational speed of said engine; (c) detecting the value of said predetermined parameter; (d) determining whether or not said predetermined fuel cut condition has been fulfilled, from the detected values of the engine rotational speed and said predetermined parameter; (e) when fulfillment of said predetermined fuel cut condition is determined in said step (d), calculating the sum of fuel injection quantities supplied to said engine upon generation of each pulse of said predetermined control signal after fulfillment of



said predetermined fuel cut condition has been determined; (f) determining whether or not the calculated sum of fuel injection quantities exceeds a predetermined value corresponding to the maximum allowable fuel quantity that can be supplied to said engine per unit time so as to maintain the bed temperature of said catalyst device below said maximum allowable bed temperature; and (g) cutting off the supply of fuel to said engine when it is determined in said step (f) that the calculated sum of fuel injection quantities exceeds said predetermined value.

4,621,601

FUEL INJECTION PUMP IN INTERNAL COMBUSTION ENGINES

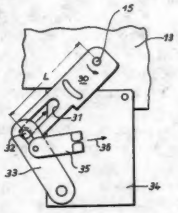
Roland Kupzik, Nagold, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 2, 1985, Ser. No. 718,968

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418174

Int. Cl.⁴ F02D *31/00*

U.S. Cl. 123—374 **5 Claims**



1. A fuel injection pump for internal combustion engines having a housing, an arbitrarily actuable adjusting lever, the movement of which can be fed in the form of a set-point variable into an rpm governor for the purpose of fuel metering, comprising a coupling device disposed between said arbitrarily actuable adjusting lever and said rpm governor, said coupling device generates a non-linear relationship between said arbitrarily adjusting lever and a degree of intervention with said rpm governor, said coupling device includes a lever having an oblong slot in its longitudinal axis, said lever being supported unilaterally and supported at one end, a guide element slidably supported in said oblong slot wherein said arbitrarily adjusting lever engages an adjusting device and movement of said lever is imparted to said rpm governor, said adjusting device comprises an auxiliary adjusting lever arranged to cooperate with said oblong slotted lever by means of a knee-lever arrange-

ment, said knee-lever arrangement having a knee joint which slides in said oblong slot.

4,621,602

KNOCK CONTROL SYSTEM FOR AUTOMOTIVE ENGINES

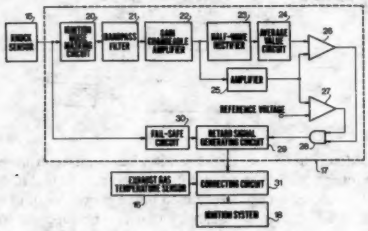
Masaaki Furuyama, Hoya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 679,961

Claims priority, application Japan, Dec. 12, 1983, 58-234095

Int. Cl.[4] F02P 5/145

U.S. Cl. 123—425 **7 Claims**



1. An improved knock control system for an automotive engine, of the type having an ignition system, a knock sensor for sensing vibration of the engine, a knock control unit comprising a knock detecting circuit responsive to an output signal of the knock sensor for producing a knock signal, a retard signal generating circuit responsive to the knock signal for producing a retard signal to retard ignition timing of the ignition system, a fail-safe circuit which producs a fail-safe signal for retarding the ignition timing at fault of the knock sensor, wherein the improvement comprises:

an exhaust gas temperature sensor for producing a temperature signal when the exhaust gas temperature exceeds a predetermined temperature;

a correcting circuit responsive to the retard signal, fail-safe signal and the temperature signal for producing a correction signal which is applied to the ignition system to control the ignition timing,

the correction circuit being so arranged to respond to the temperature signal to reduce the retardation degree decided by the fail-safe signal;

an engine speed detecting circuit for producing an engine speed signal when engine speed exceeds a predetermined value; and

a switching circuit responsive to the engine speed signal to further reduce the retardation degree decided by the fail-safe signal;

the engine speed detecting circuit comprises an F/V converter for converting ignition pulses of the engine to voltage and a comparator to compare the voltage with a reference value to produce the engine speed signal, and

the switching circuit comprises a transistor responsive to the engine speed signal and a resistor connected to the transistor in series.

4,621,603

ENGINE COMBUSTION CONTROL WITH FUEL BALANCING BY PRESSURE RATIO MANAGEMENT

Frederic A. Matekunas, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1985, Ser. No. 792,677

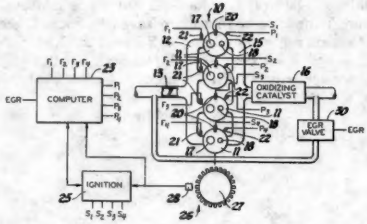
Int. Cl.[4] F02P 5/14

U.S. Cl. 123—425 **2 Claims**

1. A combustion control for an internal combustion engine of the type having a plurality of combustion chambers, air supply apparatus for the combustion chambers, fuel supply apparatus having individual control for each combustion chamber, a rotating crankshaft and ignition apparatus for the combustion chambers comprising, in combination:

means responsive to the pressure in each combustion chamber to generate signals for a combustion event indicating combustion pressure and motored pressure at a predetermined crankshaft rotational angle at substantially complete combustion;

means effective to compute, from the signals, a ratio of combustion pressure to motored pressure at the predetermined crankshaft rotational angle at substantially complete combustion;



means effective to derive from values of the ratio computed by the last means an average ratio for all combustion chambers and adjust the fuel supplied to each combustion chamber in accordance with the average ratio less one divided by the ratio for that combustion chamber less one to even the fuel distribution among the combustion chambers, whereby the fuel flow is optimized for lean burn operation.

4,621,604

FUEL INJECTION SYSTEM FOR A MIXTURE-COMPRESSING SPARK IGNITION INTERNAL-COMBUSTION ENGINE

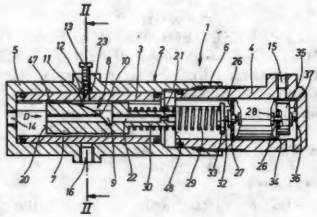
Jörg Abthoff, Pluederhausen; Hans-Dieter Schuster, Schorndorf, and Karlwalter Schmidt, Weinstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 717,008

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1984, 3411333

Int. Cl.[4] F02M 39/00

U.S. Cl. 123—446 **18 Claims**



1. A fuel injection system for a mixture-compressing spark ignition internal-combustion engine having a fuel-metering device comprising a housing with a control cylinder arranged therein, a control piston having at least two control edges rotatably and longitudinally slidably arranged in said control cylinder, one front surface of said control piston being acted upon by fuel and the other front surface of said control piston interacting with a pressure spring, and being provided with a control space area between the control edges, and the housing having an inflow opening for a fuel inflow pipe, an outflow

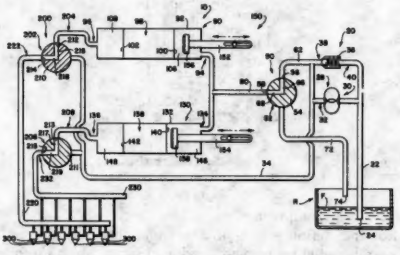
opening for a fuel return-flow pipe in which a pressure regulating valve is arranged, and an outflow opening assigned to a fuel injection nozzle, said outflow opening being connected with a control opening in the control cylinder interacting with the control edges, wherein the control space area includes at least one recess at the control piston having a circular-arc-shaped area segment forming the control edges, the axis of said area segment extending transversely to the control piston axis and which starting at the circumferential area of the control piston extends into it in a concavely curved manner, and wherein the control piston has an axial flow-through bore equipped with a throttle downstream from the recesses, the fuel flowing through said flow-through bore from the inflow opening of the housing to the recesses and to the outflow opening of the housing.

4,621,605

POSITIVE DISPLACEMENT FUEL INJECTION SYSTEM

Alfred W. Carey, Jr., and Lester L. Peters, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 30, 1983, Ser. No. 567,180
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—446 11 Claims



1. A variable timing fuel injection system for intermittently injecting fuel into the combustion chamber of a cyclically operating internal combustion engine, comprising

(a) fuel supply means for providing a supply of liquid fuel at low pressure and fuel slug forming means associated therewith

(b) injector means adapted to be mounted adjacent the combustion chamber of the internal combustion engine and fluidically connected with fuel supply means for receiving fuel from said fuel supply means and for cyclically injecting fuel slugs under high pressure into the combustion chamber; said injector means including timing fluid receiving means for controlling the timing of fuel injection during engine operation in dependence upon the volume of timing fluid slugs received by said injector means; and

(c) timing slug forming means adapted to be mounted remote from said injector means for metering slugs of timing fluid and for delivering each premetered slug of timing fluid to said injector means prior to the commencement of injection of fuel whose timing is to be controlled wherein said fuel supply means comprises pump means and said slug forming means comprise slug size control means for controlling the pump means to set the size of said timing and fuel slugs, wherein said slug size control means includes a fuel piston associated with said fuel slug forming means for forming and delivering the fuel slugs and a timing fluid piston associated with said timing slug forming means for forming and delivering the timing slugs, first movable stop means for controlling movement of said fuel piston and setting the size of the fuel slugs formed thereby, second stop means for controlling movement of said timing fluid piston and setting the size of the fuel slugs formed thereby and adjustment means for controlling each of said movable stop means on a cycle-by-cycle basis.

4,621,606

AUXILIARY ARROW HOLDER APPARATUS

Dennis M. Toth, 1746 Oakwood, Trenton, Mich. 48183

Filed May 25, 1984, Ser. No. 613,976
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—24 A 18 Claims

1. An auxiliary arrow holder for an archery bow comprising:

a mounting plate;

first means for securing said mounting plate to the archery bow;

second means attached to said mounting plate for retaining a single arrow on said bow in parallel spaced relationship to the bow, said second means including an arm extending from said plate having converging top and bottom edges extending from the opposite ends of the mounting plate to a central portion and said top and bottom edges diverging from said central portion to an arrow support bracket having two vertically aligned spring clips for detachably holding the single arrow.

10. The combination of a quiver and an auxiliary arrow holder for use with an archery bow comprising:

a plate being adapted to be secured to the archery bow;

first and second means formed on the plate and the quiver for detachably securing the bow quiver to said plate;

an arm extending from said plate independently of the quiver, said arm having a broad area of attachment to the mounting plate, a central portion having a reduced thickness for reducing visual obstruction about said central portion, and a broad area of attachment to an arrow support bracket having a third means for detachably retaining a single arrow independently of the quiver.

4,621,607

FULL FIST ARROW RELEASE

Lynn H. Busch, R2, Algoma, Wis. 54201, assignor to Lynn Harlan Busch, Algoma, Wis.

Filed Dec. 3, 1984, Ser. No. 677,468
Int. Cl.[4] F41C *19/00*; F41B *5/00*
U.S. Cl. 124—35 A 3 Claims

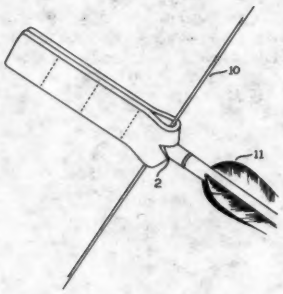
1. A full fist arrow release capable of receiving a bow string and an arrow nock, and capable of being grasped by the full fist of a user for drawing the bow string back and upon opening the user's hand, releasing the arrow, said full fist arrow release comprising,

an elongated strip of material doubled together forming a crease along its width, resulting in a first end and a second end;

said first end comprising two contiguous end portions of said elongated strip, and fastening means for securing together said end portions;

said second end comprising an opening formed between said fastening means and said crease, said opening having an axis extending along the width of said strip, said crease provided with means for receiving the nock of an arrow

such that the nock extends through the strip at said crease and into engagement with a bow string;



said opening adapted to receive a bow string therethrough for securing said arrow release to the bow string;

said first end adapted to be grasped by the full fist of a user.

4,621,608

PORTABLE BARBECUE SYSTEM

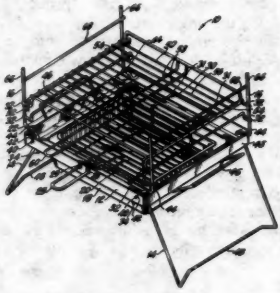
James F. Lee, 218-12 43rd Ave., Bayside, N.Y. 11361

Continuation of Ser. No. 624,144, Jun. 25, 1984, Pat. No. 4,526,158. This application Apr. 8, 1985, Ser. No. 721,081

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.[4] F24C *1/16*

U.S. Cl. 126—9 R **19 Claims**



1. A portable barbecue comprising:

a frame with an open center having front, rear and side walls and an inwardly extending annular bottom flange;

first and second leg members hingedly engaging said frame to assume a first, folded position juxtaposed to the bottom of said frame and a second, supporting position extending away from the bottom of said frame;

first and second grill rack members hingedly engaging said frame to assume a first, closed position juxtaposed to the top of said frame and a second, upright position extending upwardly from the top of said frame;

a disposable heat reflecting drip pan having an outwardly extending annular lip adapted to engage said annular bottom flange on said frame such that said drip pan assumes a working position occupying the open center of said frame when said leg members are in said second, supporting position;

a removable fire basket engaging said frame and overlying said disposable drip pan in said working position;

a removable cooking grill adapted to slidably mount across said first and second grill rack members; and

leg locking means for securing said first and second leg members in said second supporting position.

4,621,609

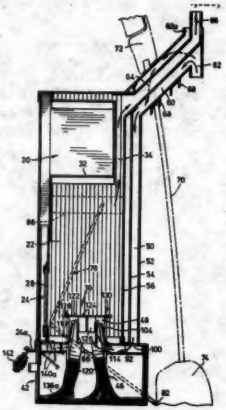
HEATER AND BURNER ASSEMBLY THEREFOR

John A. Kitchen, R.R. #3, Hastings, Ontario, Canada (K0L 1Y0)

Filed Aug. 27, 1984, Ser. No. 644,287

Int. Cl.[4] F24C *1/00*; F23D *11/00*

U.S. Cl. 126—56 **14 Claims**



1. A heater comprising:

a housing defining a combustion chamber and adapted to permit radiation of heat produced by combustion in said chamber, the combustion chamber having an exhaust outlet, and the housing including a combustion air inlet passageway;

a fuel reservoir disposed in said housing below the combustion chamber, for containing a fuel supply;

a burner disposed in the combustion chamber and comprising: a combustion air inlet tube disposed in a generally upright position above said fuel reservoir and having an air outlet at its upper end and an air inlet at its lower end, said air inlet communicating with said combustion air inlet passageway; a wick in the form of a mass of non-combustible fibres wrapped around an annular support surrounding said air outlet and defining a combustion zone; means constraining the fibres to extend downwardly from said support and into the fuel reservoir for conveying liquid fuel to said combustion zone; and means for delivering secondary combustion air to said combustion zone externally of the wick, from said combustion air inlet passageway; said means constraining the fibres of the burner comprising a series of tubes extending downwardly from positions adjacent said air outlet of the combustion air inlet tube and into the fuel reservoir, said fibres being disposed in said tubes, the tubes being coupled together adjacent said inlet tube to provide a substantially continuous annular wick and being spaced from one another away from said tube to permit said secondary combustion air to flow outwardly between the tubes;

and,

a vent duct defining a first passageway providing communication between said air inlet passageway in the housing and a remote air inlet at an outer end of the duct, and a second passageway providing communication between said combustion chamber exhaust outlet and an exhaust opening adjacent said air inlet, said duct being of elongate

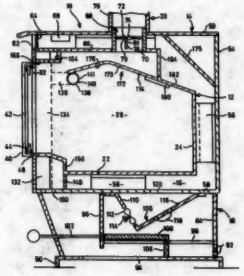
form and extending outwardly from said housing to space said air inlet and exhaust outlet from the housing so as to permit the heater to be disposed within a space to be heated and vented outside said space by way of said vent.

4,621,610

SOLID FUEL HEATING APPARATUS

Walter K. Tomooka, 143 W. Powers Cir., Littleton, Colo. 80120

Filed Jan. 31, 1985, Ser. No. 696,652
Int. Cl.[4] F24C *1/14*
U.S. Cl. 126—61 **38 Claims**



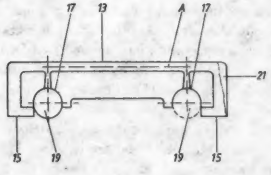
1. A solid fuel heating apparatus comprising an enclosed firebox having support means to support combustible fuel, a flue to allow egress of by-products of combustion from the firebox, means to permit placement of fuel within said firebox, a baffle extending partially across the firebox between said support means and said flue to inhibit the direct passage of combustion by-products from the support means to the flue, and air supply means to supply air to the interior of said firebox to support combustion therein, said air supply means including a manifold having a first branch to convey air to a location adjacent said support means with outlet means therein to direct air toward the interior of fuel on said support means, and a second branch connected to said first branch and located at an edge of said baffle means, said second branch having outlet means to direct air toward said support means, said outlet means and said baffle being configured to induce bodily rotation of said combustion by-products within said firebox during combustion of fuel on said support means.

4,621,611

GRATE ROD

Theodor Koch, Butzenstrasse 20, 8304 Wallisellen, Switzerland

PCT No. PCT/CH84/00080, § 371 Date Jan. 22, 1985, § 102(e) Date Jan. 22, 1985, PCT Pub. No. WO84/04799, PCT Pub. Date Dec. 6, 1984
PCT Filed May 18, 1984, Ser. No. 705,436
Claims priority, application Switzerland, May 20, 1983, 2767/83
Int. Cl.[4] F23H *7/08*
U.S. Cl. 126—174 **6 Claims**



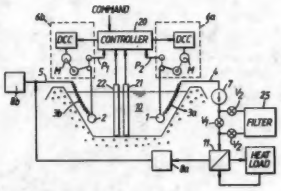
1. A grate bar for use in a furnace grate wherein a plurality of grate bars are arranged at one of their end portions in rows on a respective grate rod and wherein said rows of bars overlap each other so that said one of their end portions are protected from furnace wear by the other of said end portions of said bars of a next row, said rows being linearely movable forth and back on and relative to each other propelled by respective rods, said grate bar comprising at each end portion a link means for one of said rods and a rest surface to rest on a bar of a subsequent row, said link means and rest surfaces of said bar enabling first using one of said end portions to rest on said rod while the other of said end portions is to rest on another bar, and after wear of said other end portion, to use each other end portion to rest on said rod and said first end portion to rest on said another bar.

4,621,612

SOLAR POND AND METHOD OF ESTABLISHING THE SAME

Yasunobu Nakamoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 22, 1985, Ser. No. 768,227
Claims priority, application Japan, Aug. 27, 1984, 59-176572
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—415 **14 Claims**



1. A solar pond for absorbing and storing solar energy as heat, comprising:

pond means for storing water;

intake means in said pond means for taking water from said pond means;

return outlet means in said pond means for returning water into said pond means;

circulation loop means connected between said intake means and said return outlet means;

feed-water pump means disposed in said circulation loop means;

a tank apparatus disposed in said circulation loop means, said tank apparatus including means for adjusting saline concentrations of water within said circulation loop means;

controller means including saline concentration detector means for detecting saline concentrations of water in said pond means at levels of said pond means corresponding to vertical positions of said intake means, said controller means further including means for producing output signals as a function of said detected saline concentrations; and

means for adjusting vertical positions of said intake means and said return outlet means in response to said output signals from said controller means.

4,621,613

POOL AND SPA HEATING AND COOLING

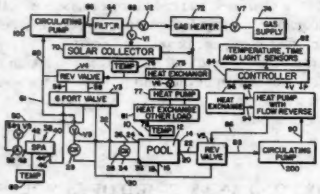
Mark U. Krumhansl, 1811 Bent Twig, Tustin, Calif. 92680

Filed Jan. 25, 1979, Ser. No. 6,338
Int. Cl.[4] F24K *2/42*
U.S. Cl. 126—416 **10 Claims**

1. The method of treating a body of water confined in a container having a lower opening and an upper opening, each opening having communication with said body of water, with the aid of a pump and a heater connected to a water circulating circuit which method comprises the steps of:

causing water to flow through said circuit and through said

heater in one direction from said body of water through said upper opening and then back to said body of water through said lower opening until the temperature of water in said body of water has been elevated to a selected level; and



thereafter causing water from said body of water to continue to flow through said circuit in one direction while causing the water to flow from said body of water through said lower opening and to be returned to said body of water through said upper opening.

4,621,614

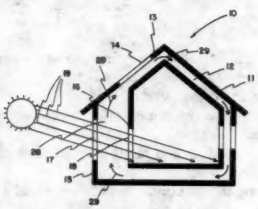
HEAT STORAGE MEANS

Jr. Sykes, Rte. 1, Box 67, Wake Forest, N.C. 27587

Continuation of Ser. No. 478,068, Mar. 23, 1983, abandoned. This application Apr. 17, 1985, Ser. No. 724,290

Int. Cl.⁴ F24J *2/00*

U.S. Cl. 126—417 **1 Claim**



1. A passive solar building structure comprising: an outer house like structure constructed partly from light transmissive material and substantially the remainder from salt-impregnated wood; an inner house like structure disposed interiorly of said outer structure constructed partly from light transmissive material and substantially the remainder from salt-impregnated wood, at least one light transmissive portion of said outer structure being opposite a salt-impregnated wood portion of said inner structure and located near an upper portion of said house like structures respectively, said outer structure and said inner structure defining a closed loop air circulation channel therebetween which encircles said inner structure whereby solar light will pass through said at least one light transmissive material to heat said opposite salt-impregnated wood which in turn creates natural convection air circulation within said closed loop channel to allow portions of said salt-impregnated wood which are not in direct contact with said solar light to absorb and store the air circulated heat.

4,621,615

ENERGY CONTROL DEVICE

Thomas D. McGee, 2924 Woodland, Ames, Iowa 50010

Filed Aug. 19, 1985, Ser. No. 766,798

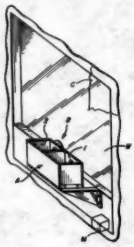
Int. Cl.⁴ F24J *2/40*

U.S. Cl. 126—419 **9 Claims**

1. A heat transfer sensing apparatus for operating a movable thermal barrier for covering and uncovering a window in a room comprising:

(a) first and second means for sensing temperature;

(b) mounting means for mounting the first and second temperature sensing means adjacent a window so that both temperature sensing means are exposed to the convective heat transfer conditions within the room and the first temperature sensing means can be heated or cooled by radiant energy through the window;



(c) means for shielding the second temperature sensing means from direct radiant heat transfer through the window;

(d) signal generating means connected to the first and second temperature sensing means for generating a signal depending on the difference in temperature of the temperature sensing means; and

(e) means for moving the thermal barrier based on said signal and on whether or not it is desired that radiant heat enter, or leave, the room.

4,621,616

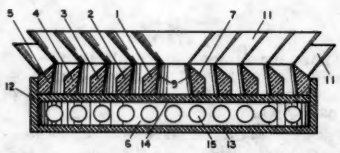
ANNULAR SOLAR PANEL

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed May 13, 1985, Ser. No. 732,982

Int. Cl.⁴ F24J *3/02*

U.S. Cl. 126—440 **1 Claim**



1. An annular solar panel comprising five concentric annular conical beam concentrators (1 through 5), a black-water heat-collection heat-transfer tank (6), and tubes (15) through which domestic household water circulates;

each conical beam concentrator (1 through 5) having a convex conical section (7) which receives and transmits a convergent conical incipient beam (8) of diffused solar radiation and having a concave conical section (9) which refracts and emits beam (8), forming a concentrated annular beam (9),

black-water tank (6) comprising a cylindrical wall (12), a base (13) and a plate-glass cover window (14) serving as mounting platform for conical beam concentrators (1 through 5), and

tubes (15) comprising conduits submerged in black-water tank (6).

4,621,617

ELECTRO-MAGNETICALLY CONTROLLED ARTIFICIAL HEART DEVICE FOR COMPRESSING CARDIAC MUSCLE

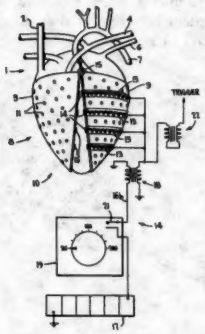
Devendra N. Sharma, 22 Carroll House Barrie Estate, Gloucester Terrace, London W2 3PR, United Kingdom

Filed Jun. 1, 1982, Ser. No. 383,618

Claims priority, application United Kingdom, Jun. 29, 1981, 8119920; Jun. 29, 1981, 8200231; Jun. 29, 1981, 8200974

Int. Cl.[4] A61M *1/10*; A61H *1/02*; A61F *2/22*

U.S. Cl. 128—1 D 5 Claims



1. An artificial heart device comprising compressor means adapted to be associated with a mammalian heart for compressing the cardiac muscle to stimulate the normal pumping action thereof, and control means for electromagnetically controlling the operation of said compressor means, said compressor means comprising a pair of first and second compressor components adapted to be disposed on the surface of the heart in spaced relationship for electromagnetic interaction to compress said cardiac muscle on actuation of said control means, wherein the first compressor component includes a set of pole elements disposed for electromagnetic interaction with a set of corresponding pole elements on the second compressor component.

4,621,618

DUAL VIEWING AND CONTROL APPARATUS FOR ENDOSCOPE

Yasuhiko Omagari, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Japan

Filed Feb. 27, 1985, Ser. No. 706,121

Claims priority, application Japan, Feb. 28, 1984, 59-36722

Int. Cl.[4] A61B *1/02, 1/06*

U.S. Cl. 128—6 27 Claims

1. A dual viewing and control endoscope apparatus comprising:

an endoscope, including an operating body, an endoscope eyepiece located on said operating body, an insertable portion extending from said operating body, an image pickup means for transmitting an optical image from a distal end of said insertable portion to said endoscope eyepiece portion, actuation means for actuating said endoscope as a function of control signals applied thereto, and first control means attached to said operating body for generating said control signals;

a parent eyepiece member optically coupled to said endoscope eyepiece and disposed at a position adjacent said operating body, said parent eyepiece member having a mounting end for mounting said parent eyepiece member on said endoscope eyepiece and having a viewing end adjacent said mounting end whereby a first operator of said apparatus can view an image from said viewing end of said primary eyepiece member and can simultaneously operate said first control means attached to said operating body; and

a remote viewing and control means coupled to said parent eyepiece member for enabling a second operator of said endoscope apparatus to view said image obtained by said

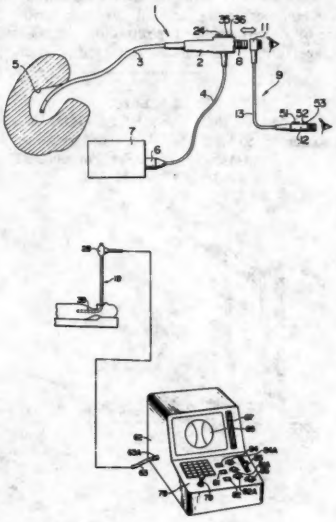


image pickup means at a position remote from said operating body and to simultaneously generate endoscope actuating control signals from said position remote from said operating body whereby said first and second operators can each simultaneously view said image and operate said endoscope.

4,621,619

RETRACTOR HAVING MEANS FOR ATTACHMENT TO PATIENT'S SKIN

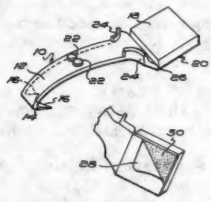
David T. Sharpe, Leeds, England, assignor to Plastech Research & Design Limited, Leeds, England

Filed Mar. 7, 1985, Ser. No. 709,325

Claims priority, application United Kingdom, Mar. 10, 1984, 8406333

Int. Cl.[4] A61B *17/02*

U.S. Cl. 128—20 12 Claims



1. A retractor for hand application and comprising (a) a rigid body portion adapted to be gripped by the fingers of one hand, (b) a head portion at one end of the body portion and comprising hook means for engaging the edge of an aperture or incision in tissue;

(c) a tail portion at the other end of the body portion; and

(d) pressure sensitive adhering surface on an underside surface of the tail portion,

whereby said rigid body portion can be gripped by the fingers of one hand, the hook means engaged in an aperture or incision, the retractor pulled to open the aperture or incision and the tail portion fixed to a patient by the simple step of pressing the pressure sensitive adhering surface against the skin or other surface complementary to said pressure sensitive adhering surface to thereby anchor the retractor and maintain the edge of the aperture or incision in a retracted position.

4,621,620

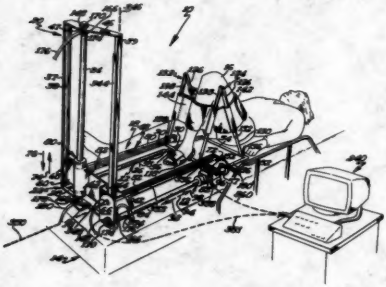
HUMAN LIMB MANIPULATION DEVICE

Gene Anderson, 832 3rd Ave., Apt. 104, Excelsior, Minn. 55331

Filed Apr. 16, 1984, Ser. No. 600,502

Int. Cl.[4] A61H *1/02*

U.S. Cl. 128—25 R **33 Claims**



1. A human limb manipulation device usable with a power source having electrical and fluidic energy supplies to stretch and strengthen the limb, comprising:

a rigid frame including a base;

a carriage movably mounted to said frame for back and forth movement parallel to a first axis;

a first transducer connectable to the power source and mounted between said frame and said carriage to selectively, reciprocatingly move said carriage relative to said frame and along said first axis;

a sub-carriage movably mounted to said carriage for back and forth movement parallel to a second axis oriented substantially perpendicular to said first axis;

a second transducer connectable to the power source and mounted between said carriage and said sub-carriage to selectively, reciprocatingly move said sub-carriage relative to said carriage along said second axis; and

means on said sub-carriage for supporting and retaining the limb so as to carry the limb with said sub-carriage during movement of said sub-carriage to stretch and strengthen the limb during movement of said carriage and said sub-carriage along said first and second axes.

4,621,621

VACUUM VALVE SYSTEM

John P. Marsalis, 19735 Michaels St., Castro Valley, Calif. 94546

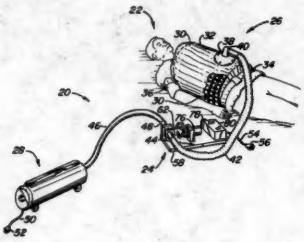
Filed Feb. 19, 1985, Ser. No. 702,981

Int. Cl.[4] A61H *31/02*

U.S. Cl. 128—30.2 **4 Claims**

1. In a respirator assembly or the like includng a pressure source, valve means coupled to said pressure source, a patient adaptor coupled to said valve means, said valve means being movable between a position communicating a pressure from said pressure source to said patient adaptor and a position communicating a different pressure to said patient adaptor, and valve drive means coupled to said valve for movement thereof between the positions in a repetitive cycle, said valve drive means being independently variable as to the total cycle time of said valve means and the duration of said valve means in each of said positions, the improvement comprising:

said valve means including a base, a first conduit mounted to said base and having one end connected to one of said pressure source and said patient adaptor and having an opposite end, an arm, a second conduit carried by said arm and having one end connected to a remainder of said pressure source and said patient adaptor and having an opposite end, mounting means mounting said arm to said base for movement between an aligned position wherein the opposite end of said second conduit is substantially



aligned with the opposite end of said first conduit for the communication of said pressure from said pressure source through said valve means to said patient adaptor and a non-aligned position wherein the opposite ends are not aligned with each other to permit communication of said different pressure through one of the opposite ends to said patient adaptor, said mounting means mounting the arm for movement of the second conduit to and from said aligned position with the opposite ends of the two conduits being proximate but in unsealed relation during said movmeent; and

said valve drive means including a drive surface on said arm at a spaced distance from said mounting means, and a powered cam assembly engaging said drive surface and formed to move said arm through said drive surface.

4,621,622

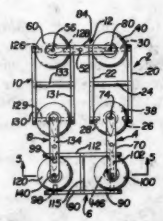
APPARATUS FOR ENTERTAINMENT, THERAPEUTIC USES AND THE LIKE

Norman Beck, 541 Mellon St., Pittsburgh, Pa. 15206

Filed Apr. 12, 1985, Ser. No. 722,600

Int. Cl.[4] A61H *11/00*

U.S. Cl. 128—58 **16 Claims**



1. An apparatus comprising

a plurality of frame elements,

each said frame element having a pair of exterior frame members and a pair of axles oriented generally transversely with respect to said framing members,

a plurality of pivotable elements each pivotally secured to two said frame elements,

each said frame element having a pair of said pivotable elements rotatably secured thereto for rotation of each said element about a different one of said axles,

said pivotable elements being at least partially received within said frame elements each said pivotable element being mounted for rotation about a first axis of a first said framing element and rotation about a second axis of a second framing element which is generally perpendicular with respect to the first axis,

each said frame element having a transverse framing member fixedly secured to said exterior framing members, and

said transverse framing member being disposed in spaced generally parallel relationship with respect to said axles.

4,621,623

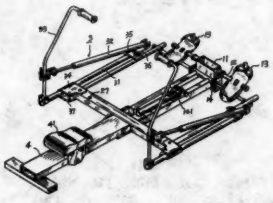
MULTI-FUNCTION GYMNASTIC DEVICE

Leao Wang, No. 59 Mei Ts'un Road, Taichung City, Taiwan

Filed Jan. 25, 1985, Ser. No. 694,781

Int. Cl.[4] A63B *69/06, 21/00*

U.S. Cl. 128—72 **1 Claim**



1. A physical exercising apparatus comprising:

a longitudinal ground-engaging base near one end of which a user seat is secured at a preselected position;

a substantially rectangular frame pivotably connected to the another end of the longitudinal base such that the frame can either be closed against the base into a first position in which the frame is substantially coplanar with the base or be opened into a second position in which the frame is supported erect and substantially perpendicular to the base; and

a pair of resistance assemblies, each comprising an elongated supporting member adapted to be coupled onto the frame, a pivoted movable lever being connected to one end of the support member and having a handle adapted to be grasped and moved by a user, and a resistance means coupled to the lever and the support member for providing resistance to movement of the lever; the lever being pivotably connected to the support member in such a manner that the lever can be rotated around the axis of the support member in addition to the pivotal movement with respect to the support member, the resistance means being coupled to the support member in such a manner that the resistance means can be rotated around the axis of the support member together with the lever; whereby the orientation of the frame and the handles as well as the levers can be readily arranged for various predetermined modes of exercises.

4,621,624

LINER FOR ORTHOPEDIC CAST

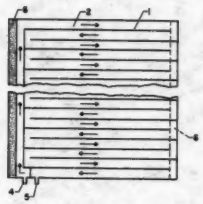
Eric R. Rayboy, 7361 N.W. 36 St., Lauderhill, Fla. 33319

Filed Jan. 13, 1984, Ser. No. 570,598

Int. Cl.[4] A61F *7/00*

U.S. Cl. 128—83 **6 Claims**

1. An orthopedic cast including an outer rigid cast material, an orthopedic cast liner of plastic material and a wool-like fuzzy surface located on the outside surface of said cast liner, said cast liner comprising a cylindrically-wrapped, rectangular bladder which includes an integral matrix of flow channels, said flow channels being adapted to contain a liquid and having an inlet tube and an outlet tube, whereby a liquid can be flowed into and through said bladder, wherein the outer surface of said



bladder contains a wool-like, fuzzy surface texture, said orthopedic cast being formed around said wool-like outer surface on said bladder of said cast liner when said cast liner is in place on a patient's extremity, wherein the bond between said cast material and said wool-like surface of said cast liner is maximized.

4,621,625

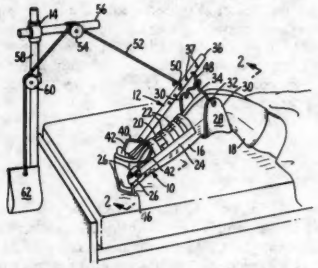
LEG TRACTION DEVICE

Powlan Roy Y., 1 Chapel Dr., Lafayette, Calif. 94549

Continuation-in-part of Ser. No. 543,857, Oct. 20, 1983, abandoned. This application Dec. 31, 1984, Ser. No. 688,076

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—84 C **15 Claims**



1. A traction system for use in treating leg fractures in a human patient, said system comprising:

(a) first means adapted to support the patient's knee and to maintain the leg in a flexed position,

(b) second means adapted to support the patient's lower leg, said second means being secured thereto so as to transmit an axial force from said second means to the patient's lower leg,

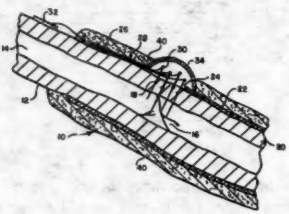
(c) a rigid, vector bar positioned immediately above and longitudinally along the patient's knee and lower leg and connected to said first and second means at two separately spaced points, and

(d) a pulley system including at least one pulley selectively fixed on a support and having a cable passing over said pulley, said cable being connected to a selected weight at one end and, at the other end, being connected to the vector bar intermediate said connection points with said first and second means whereby a steady and stable upward force is applied to the patient's knee by said first means and a steady and stable force is applied along the axis of the patient's lower leg by said second means.

4,621,626
METHOD OF MAKING SURGICAL CAST WITH WINDOW

Paul C. Haschke, 8288 W. Roosevelt Rd., Forest Park, Ill. 60130

Continuation of Ser. No. 409,734, Aug. 19, 1982, Pat. No. 4,491,128. This application Dec. 27, 1984, Ser. No. 686,779
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—91 R **1 Claim**



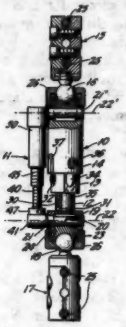
1. A method of making a cast for a body surface portion comprising, placing a non-rigid underlayer material, consisting of a cloth padding as an underlayer dressing material placed onto the body surface, except at a selected body surface portion such that the omission of under-layer material at the selected body surface portion defines an opening in said underlayer, selecting a window member slightly larger than said opening and having a periphery formed to engage the first layer of plaster surrounding the opening to enable the window member to extend across the opening to cover the opening, and a moistening cast material as a plaster bandage placed on the said underlayer around the periphery of the said window member such that the plaster bandage, upon curing holds the window member in position on the said underlayer, and allowing the casting material to cure to form a rigid cast overlayer that holds the window member non-removable in position over the selected body surface portion, thereby preventing chafing, rubbing, irritation and infection due to relative movement between the cast and the body surface and the selected body surface portion is completely sealed by the window member and the cast material and the sterility of the enclosure is assured.

4,621,627
EXTERNAL AXIAL FIXATION DEVICE

Giovanni DeBastiani, Verona; Giovanni Faccioli, Monzambano; Roberto Aldegheri, San Giovanni Lupatoto, and Lodovico R. Brivio, Castenedolo, all of Italy, assignors to Orthofix S.r.l., Verona, Italy

Filed Jan. 18, 1985, Ser. No. 692,577
Claims priority, application Italy, Dec. 18, 1984, 84975 A/84
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 ZZ **16 Claims**

1. Orthopedic external fixation apparatus, comprising an elongate extendable central body comprised of inner, intermediate and outer telescopically related parts adapted to be concentrically guided and mutually displaceable along the longitudinal axis of said body and retained against relative rotation of said parts, a first pin mount connected via a ball joint to the outer part at one end of said body, a second pin mount connected via a ball joint to the inner part at the other end of said body, the centers of said ball joints being substantially on said axis, first selectively operable means for locking a given longitudinally telescoped relation of said inner and intermediate parts, second selectively operable means for locking a given longitudinally telescoped relation of said intermediate and outer parts, selectively operable means associated with each ball joint for locking a given orientation of the involved pin mount with respect to said body, and selectively operable jack mechanism operative between said inner and outer parts for controlled length adjustment of said body, said jack mechanism comprising inner, intermediate and outer elongate members concentrically related on a common elongation axis, a first

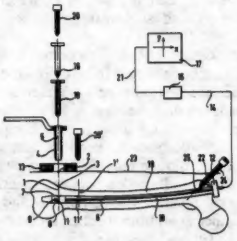


threaded engagement between said inner and intermediate members and a second threaded engagement between said intermediate and outer members.

4,621,628
APPARATUS FOR LOCATING TRANSVERSE HOLES OF INTRAMEDULLARY IMPLANTATES

Uwe Brudermann, Kiel, Fed. Rep. of Germany, assignor to ORTOPEDIA GmbH, Kiel, Fed. Rep. of Germany

Filed Sep. 6, 1984, Ser. No. 648,015
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332642
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 VD **22 Claims**



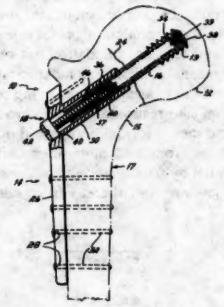
1. An apparatus for positioning a drilling jig in axial alignment with at least one predisposed transverse hole in an implanted intramedullary nail, said apparatus comprising at least a first directional element in the form of a magnet (13,16) producing a directional field, and a second directional element in the form of a magnetic field detection device (8,9) with unidirectional reception characteristic; wherein one of said two directional elements is adapted to be aligned with a directional pattern thereof to the axis of the transverse hole (11) to be located, and the other directional element is freely movable; and the output signals of the magnetic field detection device (8,9) are fed, through a signal evaluation and processing device (15), to a display device (17) displaying the relative position of the directional characteristics of said two directional elements to each other.

4,621,629

COMPRESSION HIP SCREW

James B. Koeneman, Mesa, Ariz., assignor to Harrington Arthritis Research Center, Phoenix, Ariz.

Filed Aug. 12, 1985, Ser. No. 764,319
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 YS 5 Claims



1. A compression screw for repairing a fracture between the head and neck of a femur, comprising:

a hollow lag screw having an outer end and an externally threaded inner end, said threaded inner end being adapted to be inserted through the neck and into the head of the femur, said lag screw spanning the fracture between the femoral head and neck;

a spring assembly slidably disposed within said hollow lag screw, said spring assembly having an inner end attached to said inner end of said hollow lag screw;

a side plate having a shank section connected to a barrel, said shank section being adapted to mount to the femur so that said barrel extends over said outer end of said hollow lag screw;

a compression screw extending through said barrel and into engagement with said spring assembly, said compression screw being adapted to urge said spring assembly and said lag screw attached thereto toward said side plate, the femoral head being urged by said lag screw against the neck of the femur thereby applying a compression force at the fracture therebetween.

4,621,630

GUIDE FOR FEMORAL NECK OSTEOTOMY

Robert V. Kenna, Hackensack, N.J., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Apr. 15, 1983, Ser. No. 485,541
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 VD 13 Claims

1. A guide for femoral neck osteotomy, comprising a longitudinal rod having attaching means at the lower end thereof for securing the longitudinal rod to a femur at the greater trochanter, a tranversely extending support arm secured to the longitudinal rod adjacent the lower end thereof, a guide bar connected to the support arm having at least one elongate planar surface downwardly and outwardly extending at an angle of 45° to the axis of the longitudinal rod, and a keyed connection between the support arm and the guide bar whereby the guide bar is free to slide laterally on the support

arm toward and away from the longitudinal rod but is prevented from rotating relative to the support arm.

4,621,631

PROCESS FOR THE PRODUCTION OF A BONDED COLLAGEN FIBER SHEET

Eric P. Pâques, Marburg, and Peter Fuhge, Lahntal, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,917
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1982, 3248188
Int. Cl.[4] A61F 13/00
U.S. Cl. 128—156 6 Claims

1. A process for the production of a bonded collagen fiber sheet by sequentially treating collagen containing material, which have been comminuted and washed free of blood, with a 0.5–4 molar neutral salt solution, a 0.5–2 molar citric acid solution at pH 1–4, a pepsin solution, and, where appropriate, with an ion exchanger resin to remove low and high molecular weight contaminants, precipitating the collagen with sodium chloride, dissolving the preciptate in a weakly buffered solution at pH 4–6 to form a collagen solution, dialyzing the collagen solution against water so as to precipitate the collagen fibrils, suspending the collagen fibrils and drying the collagen.

6. The application of a bonded fiber sheet produced in accordance with the process of claims 8, 3 or 2 as a covering for wounds.

4,621,632

HUMIDIFIER SYSTEM

Harold U. Bartels, Riverside, and Finn Sveen, Redlands, both of Calif., assignors to Bear Medical Systems, Inc., Riverside, Calif.

Filed Nov. 1, 1984, Ser. No. 667,142
Int. Cl.[4] A61M 16/00
U.S. Cl. 128—203.27 23 Claims

13. A humidifier system, comprising:

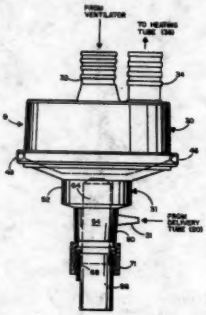
a chamber having a gas inlet for receiving breathable gas from a source thereof, a gas outlet, and a water reservoir;

water intake means for periodically supplying a relatively small amount of water to said reservoir from a water source;

a tube having a first end connected to said gas outlet, a second end adapted to be coupled to the respiratory system of a patient, and a heating element disposed between said first and second ends;

water heater means in said chamber, and operably associated with said reservoir, for boiling the water in said reservoir, thereby generating steam which heats and vapor-saturates the gas flowing into said chamber through said gas inlet;

heat exchanger means in said chamber for (a) receiving the heated, vapor-saturated air, and (b) cooling the vapor-saturated gas to cause the condensation of vapor therefrom as said gas travels to said outlet, whereby the gas at said outlet has a relative humidity of approximately 100



percent and a lower temperature than when said gas is received by said heat exchanger means;

first temperature-sensing means for sensing the gas temperature at or near the second end of said tube;

second temperature-sensing means for sensing the gas temperature at or near said gas outlet; and

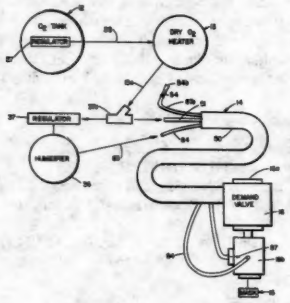
servo control means for controlling the heat generated by said heating element and said water heater means in response to the temperatures sensed by said first and second temperature-sensing means.

4,621,633

HEATED OXYGEN SYSTEM AND PORTABLE EQUIPMENT CASE FOR HYPOTHERMIA VICTIMS

Dale D. Bowles, 2443 Hemlock, and Charles L. Parmley, 13 Iris, both of Granite City, Ill. 62040

Filed Sep. 10, 1984, Ser. No. 649,268
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—203.17 **29 Claims**



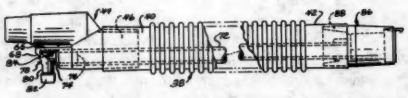
1. Emergency medical apparatus adapted for use in the emergency inhalation treatment of hypothermia victims, comprising a pressurized source of dry inhalation gas for resuscitation administration and core rewarming; a gas delivery system including a resuscitator hose having one end connected to said source and an opposite end, demand valve means connected to the opposite end of said resuscitator hose, a mask connected to said demand valve means whereby dry inhalation gas is metered to said mask; an electrical heater system including a power source and electrical control circuit means connected to said power source, primary heater means connected to said electrical control circuit for heating inhalation gas delivered through said resuscitator hose to a predetermined temperature, said electrical control circuit means including temperature control means connected to said primary heater means for regulating the temperature of said primary heater means; a humidifier unit connected upstream of said resuscitator hose to receive a portion of dry inhalation gas for selectively humidifying said portion of said dry inhalation gas outflow from said primary heater means, a mixing chamber located between said mask and demand valve means for receiving the dry inhalation gas metered from said resuscitator hose through said demand valve means, and means for delivering said portion of humidified inhalation gas from said humidifier unit to said mixing chamber in parallel by-pass relation with the remainder of said dry inhalation gas metered thereto from said demand valve means.

4,621,634

ANESTHESIA TUBING CONNECTIONS

Christopher Nowacki, Arlington Heights, and Alfred G. Brisson, Schaumburg, both of Ill., assignors to Trutek Research, Inc., Arlington Hts., Ill.

Filed Jan. 27, 1984, Ser. No. 574,341
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.18 **10 Claims**



1. Anesthesia apparatus including an outer flexible tube of predetermined diameter and having a patient end and a remote end, an inner flexible tube of lesser diameter disposed within said outer tube and extending substantially from end-to-end thereof, connection means secured to said patient end of said outer tube, said connection means having means for securing the corresponding end of said inner tube and further having means for mounting a patient anesthetic device such as an endotracheal tube, and remote connection means at the remote end of said outer tube, said remote connection means including a first tubular portion having a first end interfitting with said outer tube and a closed opposite end, a smaller inlet tubular portion within said first tubular portion and having an axis substantially parallel to and offset from the axis of said first tubular portion in a given direction, said smaller inlet tubular portion having a first and interfitting with said inner tube and an opposite end extending through said closed opposite end of said first tubular portion and adapted to interfit with a supply connector for anesthesia gas, and an exhaust tubular portion having a first end adapted to interfit with an exhaust system, said exhaust portion having an opposite end radially overlapping and being joined to and communicating internally with the interior of said first tubular portion and having an axis substantially parallel to and offset from the axis of said first tubular portion substantially opposite to said given direction, an offset portion sealingly joining said exhaust tubular portion to said first tubular portion and disposed in part beyond the circumference of said first tubular portion, said first tubular portion serving as a crank to said exhaust portion for rotating said remote connection means back and forth to interfit said remote connection means with said outer tube and with an exhaust system.

4,621,635

METHOD FOR TREATING HEMORRHOIDS

Max Ali, Belleville, Mich., assignor to Hemorrhoid Clinic of America, Oak Park, Mich.

Filed Feb. 7, 1986, Ser. No. 827,831
Int. Cl.[4] A61B 17/30
U.S. Cl. 128—303.1 5 Claims

1. A method for treating hemorrhoids comprising the steps of:

(a) evaporating the outer surface of a hemorrhoid by traversing such surface with a scanning motion of a laser beam;

(b) forming at least one cavity in such hemorrhoid by the application of the laser beam thereto to a depth sufficient to reach the approximate core thereof and to a diameter adequate to permit reception therein of a cryogenic probe; and

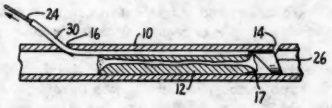
(c) freezing such hemorrhoid outwardly from its interior by inserting a cryogenic probe into each such cavity for a time sufficient to assure complete necrosis of the hemorrhoidal mass.

4,621,636

ENDARTERECTOMY METHOD AND APPARATUS

Thomas J. Fogarty, 770 Welch Rd., Palo Alto, Calif. 94304

Continuation of Ser. No. 60,000, Jul. 23, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 214,015
Int. Cl.[4] A61B 17/32
U.S. Cl. 128—304 5 Claims



5. A method for excising arteriosclerotic occlusions from arteries comprising longitudinally positioning a flexible wire in off-center relation within an artery along the interface of occlusion and artery, said wire having a cutting loop, provided with a cutting edge, attached thereto in a position to excise said occlusion as said wire is pulled along said artery, said cutting edge being disposed in a plane which defines with said carrier wire an obtuse included angle, and pulling said wire along said artery to excisingly traverse said occlusion with said loop.

4,621,637

SURGICAL DEVICE FOR REMOVING BONE AND TISSUE FROM JOINT MEMBERS

Meyer Fishbein, 12020 Saltair Pl., Los Angeles, Calif. 90049

Filed Jul. 30, 1984, Ser. No. 635,753
Int. Cl.[4] A61F 17/32
U.S. Cl. 128—305 14 Claims

1. A rotary surgical device for removing bone or tissue from the socket or the head of a bone joint member to facilitate the installation of a prosthetic device in the socket or on the head of such bone joint member, comprising:

a. a support base;

b. means to rotate the support bass about an axis thereof;

c. a hollow shell detachably secured to the support base having at least one elongated slot therein which is in communication with the interior of the shell and which provides access thereto; and

d. at least one elongated cutting blade aligned with the elongated slot in the hollow shell having

i. a lower portion which is supported by the support base in a torque transmitting relationship therewith and to drive the blade about the axis of rotation of the support base

ii. an upper portion with at least one cutting surface which projects through the elongated slot and extends a short distance beyond the outer surface of the hollow shell, said upper portion having means to guide bone or tissue removed by the cutting surface from the bone joint member through the slot in the shell and into the interior thereof.

4,621,638

HARD ELASTIC SUTURES

Thomas A. Silvestrini, East Lyme, Conn., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 635,790, Jul. 30, 1984, abandoned. This application Jul. 15, 1985, Ser. No. 754,716
Int. Cl.[4] A61B 17/00
U.S. Cl. 128—335.5 20 Claims

1. A surgical suture comprising at least one sterile hard elastic filament of a body-compatible polymer.

4,621,639

SURGICAL INSTRUMENT WITH HYDRAULIC ACTUATOR

James A. Transue, Union, and Donald M. Golden, Cherry Hill, both of N.J., assignors to Ethicon, Inc, Somerville, N.J.

Continuation-in-part of Ser. No. 345,436, Feb. 3, 1982, abandoned. This application Jul. 31, 1984, Ser. No. 636,440
Int. Cl.[4] A61B 17/04
U.S. Cl. 128—339 7 Claims

1. A device for closing a wound or incision in tissue with a fastener by implanting or inserting a fastener through said tissue, said device comprising;

(a) a housing by which said device may be grasped;

(b) a hollow needle extending outwardly from said housing and having a distal end adapted for piercing said tissue, said needle defining a passage therein for receiving at least a portion of said fastener, said passage extending along the length of said needle from an entrance aperture to a discharge aperture at said distal end;

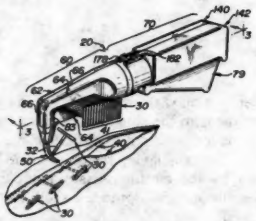
(c) a reciprocative pusher member disposed within said housing for pushing said portion of said fastener through said needle, said pusher member including at least a lead-

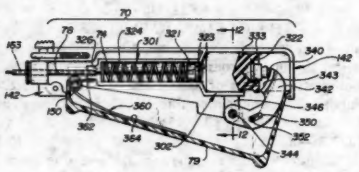
ing end segment adapted to enter and reciprocate in said needle passage and adapted to engage said portion of said fastener;

(d) a fastener magazine means for retaining and guiding a plurality of said fasteners in side-by-side relationships, said magazine means including biasing means for biasing said plurality of fasteners towards the leading end segment of the pusher member immediately prior to said segment entering said needle passage; and

(e) actuator means associated with said housing for reciprocating said pusher member leading end segment between 1) a retracted position spaced inwardly from the distal end of said needle wherein the leading end of the pusher member is located behind said fastener and 2) an extended position outwardly along said needle relative to said retracted position wherein said fastener is ejected from the distal end of said needle by said pusher member leading end segment, said actuator means being adapted for amplifying the movement of said pusher member when said apparatus is operated, said actuator means further comprising:

first and second connected cylinders in said housing, said first cylinder having a length greater than that of the second cylinder and said first cylinder having a diameter less than that of said second cylinder;





first and second pistons slidably disposed in said first and second cylinders, respectively;

a substantially incompressible fluid contained within said connected first and second cylinders between said first and second pistons;

the projection area of the pressure bearing working surface of said first piston normal to direction of the first piston movement being less than the projection area of the pressure bearing working surface of said second piston normal to the direction of the second piston movement;

means connecting said pusher member with said first piston;

a handle mounted to said housing and movable relative to said second cylinder between a releasing position and fully actuating position;

engaging means associated with said handle for engaging said second piston and being moved by said handle for forcing said second piston along said second cylinder thereby forcing said fluid from said second cylinder into said first cylinder to move said first piston and the connected pusher member whereby said leading end segment of said pusher member is moved to said extended position to eject said fastener from said needle; and

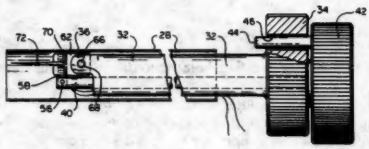
first piston biasing means for biasing said first piston along said first cylinder in a direction to return said pusher member leading end segment to said retracted position and to force said fluid from said first cylinder into said second cylinder when said handle is released.

4,621,640

MECHANICAL NEEDLE CARRIER AND METHOD FOR ITS USE

James S. Mulhollan, 3401 Foxcroft Rd., Little Rock, Ark. 72207, and Lionel Starr, 8806 Patricia Lynn, Sherwood, Ark. 72116

Filed Jan. 9, 1984, Ser. No. 569,448
Int. Cl.[4] A61B *17/06*
U.S. Cl. 128—340 **13 Claims**



6. A mechanical needle holder comprising:

a first rod member having

a knurled flange on a first end,

a pair of extending ears forming a yoke at a second end,

a channel extending along a first axis between said ends and including a passage through said knurled flange,

a second rod member carried in and being axially movable and rotatable in said channel an extending through said passage having an enlarged knurled first end adjacent said knurled flange, a pair of extending ears forming a yoke at a second end,

a needle carrying head member connected to said yoke of said first rod member to pivot about a second axis, perpendicular to said first axis, and having a passage for receiving a surgical needle, and

linkage means pivotally connected to said yoke of said second rod member and connected to said head member and including a portion engagable with said needle upon rotation of said second rod member,

whereby, axial movement of said second rod member relative to said first rod member causes rotation of said head member about said second axis through said linkage means and rotational movement of said second rod member relative to said first rod member causes engagement and disengagement of a portion of said linkage means with said needle.

4,621,641

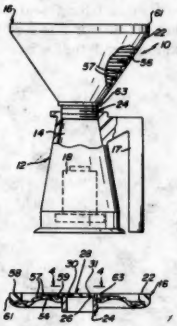
VAPORIZER AND/OR FACIAL TREATMENT DEVICE

Bernard Frank, 10155 Collins Ave., Apt. 407, Bal Harbour, Fla. 33154, and Melvin B. Greenberg, 20500 NE. 20th Pl., North Miami Beach, Fla. 33179

Filed Dec. 21, 1984, Ser. No. 684,439
Int. Cl.[4] A61H *33/12*
U.S. Cl. 128—368 **28 Claims**

28. A vaporizer and/or facial treatment device including a casing having a compartment therein for retaining liquid to be vaporized, an outlet communicating with said compartment through which steam created by vaporization of said liquid exits from said compartment, and heating means for vaporizing said liquid; characterized by a hood assembly including a collapsible shield section movable from an opened, extended condition for confining the flow of steam exiting through the casing of the compartment to a closed, collapsed condition during non-use of said hood assembly, said collapsible shield section including a bottom wall having an opening, laterally spaced-apart side walls and means connected to said bottom wall for releasably securing said collapsible shield section to

said casing, said last mentioned means having a wall portion spaced below said bottom wall and located adjacent said opening for engagement with said casing and with said opening in communication with said outlet of said casing, said side walls



including weakened hinge sections about which the collapsible shield section is adapted to move to permit said shield section to be moved between its opened, extended condition to its closed, collapsed condition.

4,621,642

MICROWAVE APPARATUS FOR PHYSIOTHERAPEUTIC TREATMENT OF HUMAN AND ANIMAL BODIES

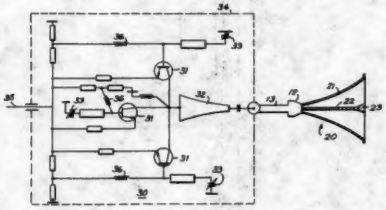
Zu-fan Chen, Beijing, China, assignor to North China Research Institute of Electro-Optics, Beijing, China

Filed Mar. 14, 1985, Ser. No. 711,847

Claims priority, application United Kingdom, Feb. 26, 1985, 8504935

Int. Cl.⁴ A61N 5/04

U.S. Cl. 128—422 **11 Claims**



1. A microwave apparatus for regulating physiological functions of human and animal bodies, comprising:

a microwave generator and a microwave applicator connected to said generator for emitting microwaves to a localized area on a body, wherein said applicator comprises inner conductor means and outer conductor means for noninvasively maintaining direct contact with the skin during treatment, said outer conductor means further serving as a screening structure.

4,621,643

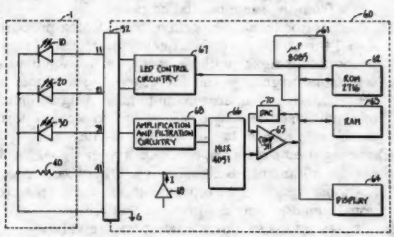
CALIBRATED OPTICAL OXIMETER PROBE

William New, Jr., Woodside, and James E. Corenman, Alameda, both of Calif., assignors to Nellcor Incorporated, Hayward, Calif.

Continuation of Ser. No. 695,402, Jan. 24, 1985, abandoned, which is a continuation of Ser. No. 414,176, Sep. 2, 1982, abandoned. This application Feb. 5, 1986, Ser. No. 827,478

Int. Cl.⁴ A61B 5/00

U.S. Cl. 128—633 **7 Claims**



1. An oximeter probe system comprising:

a first light emitting means emitting light having a first known wavelength value;

means for sensing the light emitted by said first light emitting means;

means for detachably wiring the probe to the oximeter and for providing communication of electrical signals between the probe and the oximeter;

encoding means for providing signals to the oximeter which are indicative of the known wavelength of said first light emitting means; and

decoding means responsive to said encoded signals for selecting appropriate calibration coefficients for use in calculating oxygen saturation based upon the known wavelength of said first light emitting means.

4,621,644

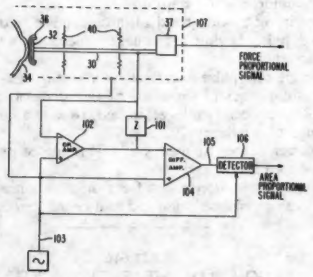
AUTOMATIC APPLANATION TONOMETER

George J. Eilers, 31537 Broadmoor Dr., Evergreen, Colo. 80439, assignor to George J. Eilers, Evergreen, Colo.

Filed Apr. 13, 1984, Ser. No. 599,968

Int. Cl.⁴ A61B 3/16

U.S. Cl. 128—652 **14 Claims**



1. An applanation tonometer for ascertaining the internal pressure of a flexible body containing a fluid, said body subject to curvature due to said internal pressure, comprising

(a) a footplate comprising a planar portion for bearing against said flexible body, a shaft for supporting said footplate and a guard electrode spaced apart from said footplate and substantially surrounding said footplate,

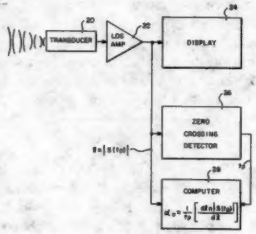
(b) a housing comprising means for supporting said footplate, said footplate capable of displacement toward said body whereby a portion of the surface of said flexible body is flattened against said footplate,
(c) force sensing means for ascertaining the magnitude of the force exerted by said flexible body against said footplate and for generating a force proportional,
(d) area signal generating means for developing an area proportional signal responsive to the area of said flexible body in contact with said footplate comprising oscillator means for driving both said footplate and said guard electrode from the same oscillating potential,
(e) comparator means responsive to said area proportional signal for establishing the equality or excess of said area proportional signal with respect to a threshold value of selectable magnitude and for generating a trigger signal representative of an area magnitude, said signal indicative of condition of equality or excess of said area proportional signal with respect to said threshold value,
(f) scaling means responsive to said trigger signal for dividing the instantaneous signal magnitude of said force proportional signal with a representation of said area proportional signal to obtain a pressure value, and
(g) display means to indicate said pressure value.

4,621,645

METHOD OF ESTIMATING TISSUE ATTENUATION USING WIDEBAND ULTRASONIC PULSE AND APPARATUS FOR USE THEREIN

Stephen W. Flax, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Sep. 14, 1984, Ser. No. 650,929
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **11 Claims**



1. A method of estimating tissue attenuation of ultrasound energy comprising the steps of:
transmitting a wide band ultrasonic pulse into said tissue, said pulse having a frequency spectrum with a center frequency,
detecting said pulse as reflected by said tissue,
estimating decay of a measure of amplitude of said reflected pulse between two levels in said tissue to approximate the slope of the decay,
estimating center frequency of said reflected pulse between said two levels, and
obtaining tissue attenuation from the approximated slope of a measure of amplitude and said center frequency.

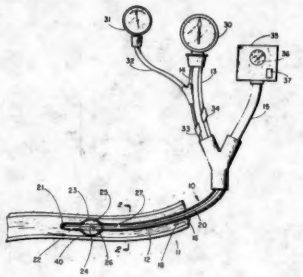
4,621,646

BLOOD FLOW MEASURING METHOD

Gordon H. Bryant, Kailua, Hi., assignor to The United States of America as Represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 15, 1983, Ser. No. 561,774
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—692 **2 Claims**

1. A method for measuring blood flow within a blood vessel comprising the steps of, inserting a catheter into the blood vessel, said catheter having a balloon which when inflated establishes an upstream and downstream side of said balloon, inflating said balloon on said catheter to contact the adjacent blood vessel walls to temporarily terminate blood flow through the blood vessel, determining the diameter of said blood vessel, partially deflating said balloon to enable the blood to flow through an annulus formed between said partially deflated balloon and the adjacent blood vessel wall,



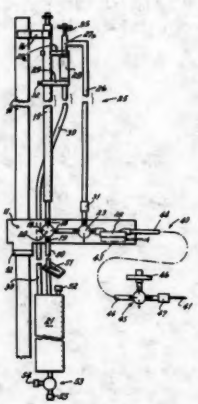
determining the diameter of said balloon, determining the area of said annulus from said blood vessel diameter and said catheter balloon diameter, recording the dynamic pressure on said upstream side of said balloon, recording the dynamic pressure on said downstream balloon side to establish the pressure difference in the blood upstream and downstream of said annulus, and determining the blood flow in response to said annulus area and blood pressure difference.

4,621,647

INTRACRANIAL PRESSURE REGULATING SYSTEM

Steven R. Loveland, Columbus, Ohio, assignor to Medex, Inc., Hilliard, Ohio

Continuation-in-part of Ser. No. 406,884, Aug. 10, 1982. This application May 23, 1984, Ser. No. 613,314
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—748 **28 Claims**



1. Apparatus for diagnosing, monitoring, and treating elevated fluid pressure within an anatomical structure comprising,
a manifold plate, means for mounting said plate on a support so that it can be vertically adjusted whereby its height can

be raised and lowered to precisely position said plate at a level chosen by the physician directly relating to anatomical structure within the patient's body,

primary and secondary stopcocks each having first, second, and third ports and mounted on said manifold plate,

the first port of said secondary stopcock being connected to the first port of said primary stopcock,

a calibrated manometer tube having one end connected to the second port of said secondary stopcock,

a fluid collector connected to the third port of said secondary stopcock and, when in operation, normally disposed below said secondary stopcock,

an automatic pressure regulator comprising an elongated tubing having first and second ends, said tubing having the first end connected to the second port of said primary stopcock, and the second end connected to said fluid collector,

means for adjustably mounting a portion of said elongated tubing intermediate its first and second ends onto said manometer tube to predetermine its vertical height along the length of said manometer tube,

a pressure tube having first and second ends, the first end of said pressure tube being connected to the third port of said primary stopcock,

an adapter means for connecting a catheter or sub-arachnoid screw or other neurosurgical appliance to the second end of said pressure tube,

whereby, in operation, said manifold plate can be mounted on a support and vertically adjusted to precisely position it at a selected position with respect to the patient's body, and said manometer tube is vertically extending, said fluid from the patient passing into said pressure tube being maintained at a pressure no greater than that indicated by the position of the intermediate portion of said elongated tubing on sald manometer tube.

4,621,648

ANKLE SUPPORT SYSTEM

Michael Ivany, 1120 S. Pine Creek Rd., Fairfield, Conn. 06430

Continuation-in-part of Ser. No. 635,002, Jul. 27, 1984, abandoned. This application Jun. 17, 1985, Ser. No. 745,377

Int. Cl.[4] A43B *7/20*; A61F *5/00*

U.S. Cl. 128—80 H **14 Claims**

6. An ankle support system comprising an ankle brace adapted to be removeably attached to the user's foot and first and second straps attached to the same side of the user's shoe and connected to the ankle brace during use, the first strap being wrapped around the lower part of the user's leg after first having passed around the back of the user's foot, and the second strap passing around the back of the user's foot after first having passed over the top of the user's shoe.

4,621,649

CIGARETTE PACKET WITH ELECTRIC LIGHTER

Hans Osterrath, D-5928 Laasphe 3, Fed. Rep. of Germany

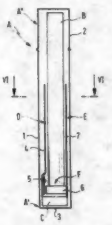
PCT No. PCT/DE83/00171, § 371 Date Aug. 23, 1984, § 102(e) Date Aug. 23, 1984, PCT Pub. No. WO84/01695, PCT Pub. Date May 10, 1984

PCT Filed Oct. 10, 1983, Ser. No. 629,825

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3240015

Int. Cl.[4] A24F *15/18*

U.S. Cl. 131—185 **31 Claims**



1. A cigarette packet assembly including a packet having an open end and a closed end, a plurality of cigarettes and an electric lighter, which assembly comprises:

(a) an electric lighter including an electric battery and a pair of electrical contacts associated with each cigarette, each pair of contacts being connected to the positive and negative poles of the battery;

(b) a lighting part carried at the end of each cigarette adjacent the closed end of the packet when the cigarette is in a stored position, each lighting part being disposable in conductive relationship with a corresponding pair of contacts;

(c) each pair of contacts including a first contact disposed in continuous conductive relationship with the lighting part and a second contact disposed out of conductive relationship with the lighting part when the cigarette is in its stored position;

(d) the second contact extending towards the open end of the packet and disposable in conductive relationship with the lighting part when the cigarette is being pulled out of the packet through the open end, thereby closing the electric circuit of the battery and heating the lighting part to a temperature sufficient to light the cigarette; and

(e) the first contact being disengageable from the lighting part for opening the electric circuit of the battery after the cigarette has moved through a predetermined distance from the stored position.

4,621,650

CIGARETTE MAKING MACHINE

Derek H. Dyett, and Michael J. Soborowski, both of High Wycombe, England, assignors to Molins Machine Co., Inc., United Kingdom

Filed Dec. 20, 1983, Ser. No. 563,616

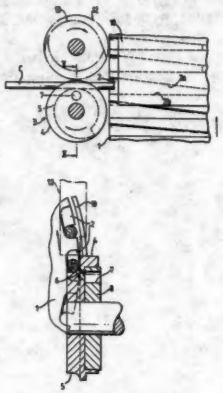
Claims priority, application United Kingdom, Sep. 13, 1983, 8324510

Int. Cl.[4] A24C *5/52*, *5/32*

U.S. Cl. 131—282 **19 Claims**

1. A machine for making cigarettes or other rod-like articles by cutting rod sections from a continuous rod, including a conveyor for carrying the articles sideways, and deflector means for receiving the articles while they are moving axially, feeding them forward at an increased speed onto the conveyor and imparting to the articles a sideways component of movement in the direction of movement of said conveyor, said deflector means including a moving part having an article contacting surface comprising a first portion which is arranged to accelerate, substantially only in an axial direction, each

article in contact with said first portion, and a second portion arranged thereafter to contact the article and impart thereto a



sideways component of movement substantially in the direction of movement of the adjacent portion of the conveyor.

4,621,651

FILTER TIP FOR A SMOKING PRODUCT

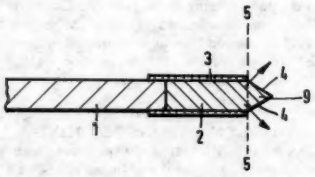
Horst Borowski; Knut Möller; Wolfgang Wiethaup, all of Hamburg; Günther Rodemeyer, Seevetal; Paul-Georg Henning, Quickborn, and Erhard Köhn, Hamburg, all of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,832

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242081; Jul. 15, 1983, 3325689

Int. Cl.[4] A24D *3/04, 3/18*

U.S. Cl. 131—361 **19 Claims**



9. A filter tip for a smoking product comprised of:

a porous filter rod attached at one end to said smoking product and having opposite said attached end a mouth end having smoke exit surfaces formed by a plurality of limiting surfaces,

a tip wrapping layer partially surrounding said filter rod, wherein said tip wrapping layer terminates at a distance in front of the mouth end of said filter rod so as to create a projecting end of said filter rod extending beyond said tip wrapping layer, said projecting end being tapered toward the mouth end of said filter rod, said taper causing smoke drawn through said filter tip to flow out obliquely with respect to the longitudinal axis of said smoking product.

4,621,652

APPARATUS FOR REMOVING SCALE FROM NUCLEAR FUEL RODS

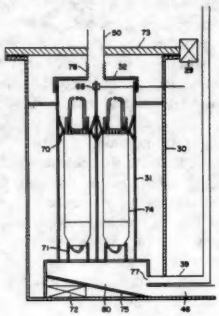
Tamotsu Ozawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Division of Ser. No. 323,126, Nov. 19, 1981, Pat. No. 4,461,650. This application Oct. 21, 1983, Ser. No. 532,965

Claims priority, application Japan, Nov. 26, 1980, 55-166378

Int. Cl.[4] B08B *5/00*

U.S. Cl. 134—95 **13 Claims**



1. Apparatus for removing scale which is deposited on a nuclear fuel rod assembly during operation of said nuclear fuel rod assembly in a boiling water type nuclear reactor, comprising a substantially sealed tank in which said nuclear fuel rod assembly is disposed, means for wetting said scale with water while said fuel rod assembly is within said tank, means for filling said tank with a gas heated to a temperature higher than room temperature for drying and peeling off said scale from said nuclear fuel rod assembly, and means connected to a bottom portion of said tank for separating peeled off scale and water discharged from said tank.

4,621,653

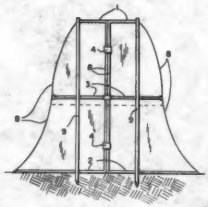
WINDSHELL

Peter Aquino, 12315 Exbury St., Herndon, Va. 22070

Filed Oct. 23, 1984, Ser. No. 663,939

Int. Cl.[4] E04H *15/58*

U.S. Cl. 135—117 **3 Claims**



1. A shelter for protection, comprising a first pair of struts: each said strut having an equal radius of curvature and being of equal length;

a first means for foldably connecting said first pair of struts end to end;

said first pair of struts being selectively positionable between an erected position wherein said first pair of struts forms an S-shaped body and a folded position wherein one of said first pair of struts is superimposed on the other to form a half S-shaped body;

a second pair of curved struts; each said strut having an equal radius of curvature and being of equal length;

a second means for foldably connecting said second pair of struts end to end; said second pair of struts being selectively positionable between an erected position wherein said second pair of struts forms a second S-shaped body and a folded position wherein one of said second pair of struts is superimposed on the other to form a half S-shaped body;

a sheet attached to said first pair of struts and said second pair of struts to form a canopy between said struts;

prop members to support one end of said struts above the ground to form said shelter;

an upper foldable cross bar connecting a first end of said first pair of struts to a first end of said second pair of struts; and a lower foldable cross bar connecting a second portion of said first pair of struts to a second portion of said second pair of struts such that said upper and said lower cross bars are selectively positionable between an extended position wherein said first and said second pairs of struts are spaced apart a predetermined distance and a folded position wherein said first and second pairs of struts are spaced apart a distance less than said predetermined distance; and

a cross support member which is foldable about an intermediate portion thereof; and first end of said cross support member contacting an intermediate region of said first pair of struts and a second end of said cross support member connected to an intermediate portion of said second pair of struts.

4,621,654

ATTITUDE AND PRESSURE RESPONSIVE VALVE

John W. Holter, Valley Forge Towers South 619, King of Prussia, Pa. 19405

Filed Feb. 3, 1986, Ser. No. 825,532
Int. Cl.[4] A61M *27/00*
U.S. Cl. 137—38 **10 Claims**

1. An attitude and pressure responsive valve assembly comprising:

an elongated hollow housing defining a fluid chamber therewithin,

a fluid inlet port in one end of said housing,

a fluid outlet port in the opposite end of said housing from said fluid inlet port,

a first pressure responsive valve and an attitude responsive valve disposed in parallel and defining alternate flow paths within said fluid chamber for fluid flowing from said inlet port through said chamber to said outlet port,

a second pressure responsive valve connecting said fluid chamber with said outlet port,

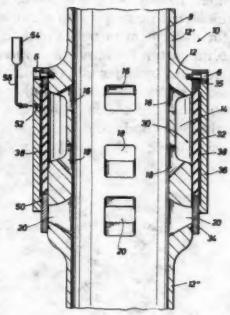
said first pressure responsive valve requiring a substantially greater fluid pressure for opening than said second pressure responsive valve.

4,621,655

MARINE RISER FILL-UP VALVE

Joseph R. Roche, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Mar. 4, 1985, Ser. No. 707,760
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—81.2 **12 Claims**



1. A marine riser fill-up valve adapted for connection in an offshore riser string through the sea comprising,

a cylindrical body having a bore therethrough for communication of drilling fluid through said riser string and having an outwardly facing annular depression formed in a first section of said body and at least one valve port formed in a second section of said body,

at least one diaphragm port formed in the wall of said body between said bore and said annular depression, and

a cylindrical member of series-connected coaxial spools including,

a cylindrical diaphragm radially deformable between a relaxed state and a deformed state and having first and second ends,

a valve spool joined at said second end of said cylindrical diphragm, and

a top ring joined at said first end of said cylindrical diaphragm, said top ring being fastened at its first end to said cylindrical body,

said cylindrical diaphragm in its relaxed state operably covering said annular depression in said body and said joined valve spool operably covering said valve port of said cylindrical body,

said cylindrical diaphragm, in response to greater sea water pressure on its outer side with respect to bore fluid pressure via said diaphragm port on its inner side, moving to a deformed state by constricting radially into said annular depression operably causing said valve spool to uncover said valve port.

4,621,656

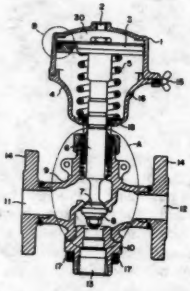
PISTON OPERATED VALVE

Tuneichi Ichimaru, Kurume, Japan, assignor to Ichimarugiken Co., Ltd., Fukuoka, Japan

PCT No. PCT/JP81/00087, § 371 Date Jul. 13, 1982, § 102(e) Date Jul. 13, 1982, PCT Pub. No. WO82/03672, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 10, 1981, Ser. No. 403,492
Int. Cl.[4] F16K *11/044, 1/44*
U.S. Cl. 137—625.66 **8 Claims**

1. A piston-operated valve comprising: a main body having an inlet port and two outlet ports all in fluid communication with one another within the interior of the main body, and having a pair of spaced apart annular valve seats; a valve body

disposed within the main body for movement between a first position in which the valve body engages one valve seat thereby closing the inlet port and providing fluid communication between the two outlet ports and a second position in which the valve body engages the other valve seat thereby closing one outlet port and providing fluid communication between the inlet port and the other outlet port, the valve body comprising a pair of annular valve body portions composed of carbon fiber-containing fluorocarbon resin each sealingly engageable with corresponding ones of the two valve seats depending on whether the valve body is in the first or second position; a cylinder having an inlet opening for admitting therethrough pressurized fluid; a piston reciprocably mounted in the cylinder for movement in opposite directions; a piston rod connected to the piston for movement therewith and slidably extending out of the cylinder into the main body; a plurality of sealing gaskets stacked one atop another and interposed between the piston rod and the main body; a biasing spring disposed within the main body and encircling the piston rod for exerting a biasing force on the stacked gaskets effective to



urge the gaskets into sliding sealing engagement with the piston rod; means for detachably connecting the valve body to the piston rod for movement therewith in response to movement of the piston thereby enabling detachment and individual replacement of the valve body portions, the means for detachably connecting the valve body to the piston rod comprising a step portion formed on the piston rod, an annular frame member removably inserted on the piston rod and having opposed annular surfaces on which are seated respective ones of the annular valve body portions, and displaceable tightening means removably connected to the piston rod and displaceable therealong for axially tightening the serial arrangement of the valve body portion-frame member-valve body portion against the piston rod step portion; and biasing means disposed within the cylinder for resiliently biasing the piston in one direction to position and maintain the valve body in the first position when pressurized fluid is not admitted through the cylinder inlet opening and for permitting movement of the piston in the other direction to position and maintain the valve body in the second position when pressurized fluid is admitted through the cylinder inlet opening.

4,621,657

AUTOMATIC WATER LEVEL MONITORING SYSTEM

Lester A. St. Ledger, Randwick, Australia, assignor to Roto Moulded Plastics Pty. Limited, New South Wales, Australia

PCT No. PCT/AU85/00076, § 371 Date Dec. 10, 1985, § 102(e) Date Dec. 10, 1985, PCT Pub. No. WO85/04735, PCT Pub. Date Oct. 24, 1985

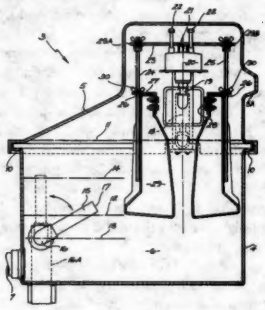
PCT Filed Apr. 10, 1985, Ser. No. 821,556

Claims priority, application Australia, Apr. 10, 1984, PG4499

Int. Cl.[4] F16K *31/26, 33/00*

U.S. Cl. 137—426 **7 Claims**

1. A water level monitoring system for a water reservoir such as a swimming pool, comprising a chamber, a water duct for connecting said chamber and said reservoir to establish corresponding water levels therein, an adjustable overflow means positioned in said chamber for determining a desired water level for said reservoir, overflow aperture means positioned at a height above said overflow tube means for said chamber for allowing water flowing from said reservoir to said chamber to pass through said overflow aperture means when the water level in said chamber exceeds the desired water level and the amount of water flow is above that able to flow through said overflow means for limiting said water level to a



maximum level within said reservoir, a fresh water inlet to said chamber connected by a substantially vertical water line to a diaphragm valve positioned above said maximum water level, an overhead actuator for said valve and an annular float in said chamber encircling at least the extended axis of said water line and supported adjustably in height within said chamber from opposite parts of said actuator to effect opening of said valve by said actuator with the water level falling below the desired water level to add fresh water to the chamber and thus to the reservoir to restore the water level to said predetermined level.

4,621,658

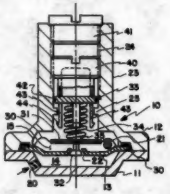
NON-REMOVABLE SPRING HOLDER FOR A PRESSURE OPERATED VALVE

John D. Buezis, Seal Beach, and Paul Dietiker, Redondo Beach, both of Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 18, 1986, Ser. No. 830,144

Int. Cl.[4] F16K *31/12*

U.S. Cl. 137—505 **5 Claims**



1. A pressure regulator valve comprising:

a valve body having a fluid inlet chamber and a fluid outlet chamber separated by an apertured wall having a valve seat opening therethrough,

a movable wall member forming one side of said outlet chamber to be exposed to a fluid pressure therein,

a valve closure member connected to said movable wall member and cooperable with said valve seat,

a spring holder being mounted in a spring housing attached to said valve body, and

a loading spring mounted between said movable wall member and said spring holder whereby upon adjustment of

the position of said spring holder changes the loading of said spring and the pressure maintained in said outlet chamber,

said spring housing having a stop to limit a downward movement of said spring holder and thus the maximum compression force on said spring to limit the maximum pressure maintained in said outlet chamber,

said spring holder having a resilient portion for engaging a second stop when said spring holder moves upward to release said spring to prevent removal of said spring holder.

4,621,659

MIXING VALVE

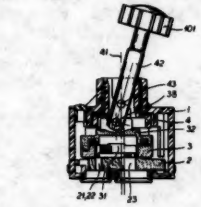
Manfred Pawelzik, Soest, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 824,623

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1985, 3503793

Int. Cl.⁴ F16K *11/06*

U.S. Cl. 137—625.17 **6 Claims**



1. In a mixing valve for sanitary conditions comprising a valve seat disk having two inlet passage openings, and a controlling disk held against said valve seat disk adjustable by a handle, the relative proportions of the fluids mixed being controlled by rotation of said controlling disk and the total flow rate of the mixed fluid being controlled by a displacement of said controlling disk, wherein said two inlet passage openings for said fluids mixed are formed symmetrically in one half of said valve seat disk, each of said two inlet passage openings being formed as an arcuate segment on a circular arc, and wherein a transfer passage formed in said controlling disk is brought into overlapping relation with said inlet passage openings adjacent an arc shaped front edge of said transfer passage, the improvement wherein the innert sides of each of said inlet passage openings have a constriction extending a distance of substantially one third of the length of said arcuate segment, and said constriction is positioned a distance of substantially 0.4 of said length of said arcuate segment from the front side of said inlet passage opening proximal to the symmetry axis of said valve seat disk.

4,621,660

BISTABLE MAGNETIC VALVE

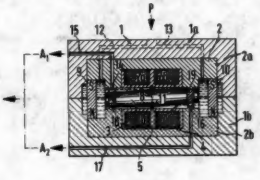
Harald Klocke, Malente, Fed. Rep. of Germany, assignor to H. Kuhne GmbH KG, Fed. Rep. of Germany

Filed Oct. 11, 1985, Ser. No. 786,812

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 3437487

Int. Cl.⁴ F16K *11/052*

U.S. Cl. 137—625.44 **8 Claims**



1. Bistable magnetic valve wherein a yoke situated in a housing secures at least one electric coil subjected to alternate pulses, and which surrounds a central space which has mounted in it an armature pivotably mounted for pivotal movement about its centre of gravity, said housing having fluid passages, the two end portions of the armature constituting valve elements for the opening and closing of said passages, permanent magnets located within the housing and being arranged to maintain a predetermined position of the armature by magnetic force, in which the armature pivot is provided by a diaphragm centrally surrounding the armature and peripherally clamped thereto in fluid-tight manner, the diaphragm dividing the central space into two substantially closed chambers with which said passages are in communication and into which the armature valve ends respectively extend, whereby the passages into the chambers are closed or opened depending on armature pivotal position.

4,621,661

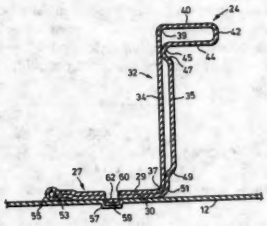
METHOD AND APPARATUS FOR STIFFENING SECTIONS AND A MECHANICAL JOINT FOR USE THEREWITH

Waldemar H. Greiner, Hamilton, Canada, assignor to Ductlok, Inc., Hamilton, Canada

Filed Feb. 1, 1985, Ser. No. 697,519

Int. Cl.⁴ B23P *19/02*

U.S. Cl. 138—172 **7 Claims**



1. A mechanical connection for connecting together a juxtaposed first and second layer of malleable sheet material, the connection comprising:

a third layer of malleable sheet material overlying the first and second layers, with the second layer sandwiched between the first and third layers,

the first layer defining a first displaced pocket projecting away from the second layer, the first pocket having integral bottom and side walls,

the second layer defining a second displaced pocket nested within said first displaced pocket, the second pocket having integral bottom and side walls,

the third layer having an aperture in registry with both pckets, the aperture resulting from the punching out of a disc which is nested within the second displaced pocket.

4,621,662

PROCESS AND APPARATUS FOR MANUFACTURING AXI-SYMMETRICAL THREE-DIMENSIONAL STRUCTURES

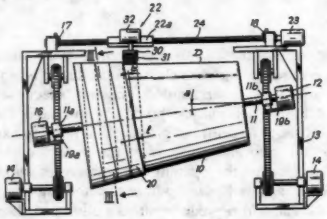
Pierre Olry, Bordeaux, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed Dec. 20, 1984, Ser. No. 685,056

Claims priority, application France, Dec. 28, 1983, 83 20948

Int. Cl.[4] B32B *31/00*

U.S. Cl. 138—129 **16 Claims**



1. A process for manufacturing a three-dimensional axi-symmetrical and non-cylindrical structure constituted by superposed and interbonded layers of fibrous material comprising the steps of:

delivering onto a rotating mandrel having an axi-symmetrical and non-cylindrical profile corresponding to that of the structure to be manufactured a tape of a fibrous material having a width that is several times less than the length of a generatrix of said structure;

winding the tape over the mandrel to form superposed layers in such a way that each of the layers is constituted by plural, successive turns of the tape of the fibrous material; and

simultaneously with said winding step, interbonding the layers together by successively needling their constitutive turns by means of an assembly of needles which extend over a distance substantially equal to the width of said tape and longitudinally movable relative to the mandrel in order to perform said needling over the width of the layers in such a way as to be sequentially positioned at the location where the tape is delivered for needling the tape simultaneously as it is being delivered thereto and wound therearound substantially across the width of each of the layers.

4,621,663

CLOTH PARTICULARLY FOR PAPER-MANUFACTURE MACHINE

Joseph Malmendier, Eupen, Belgium, assignor to Asten Group, Inc., Devon, Pa.

Filed Feb. 26, 1985, Ser. No. 705,742

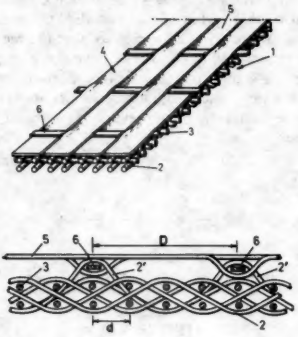
Claims priority, application France, Feb. 29, 1984, 84 03144

Int. Cl.[4] D03D *11/00*

U.S. Cl. 139—383 A **14 Claims**

1. An improved papermakers fabric of the type having at least two adjacent plies, each ply comprised of respective systems of interwoven warp and weft yarns, said plies are united by interweaving selected yarns of the respective systems, the improvement comprising:

said upper system having one set of yarns comprised of interwoven strips which substantially define the paper contact surface of the fabric, each of said interwoven strips having a width equal to at least the width occupied by two yarns of the adjacent ply directly beneath said strip



and a thickness which is less than twenty percent of the width of said strip so as to define a width to thickness ratio for said strip of at least 5:1.

4,621,664

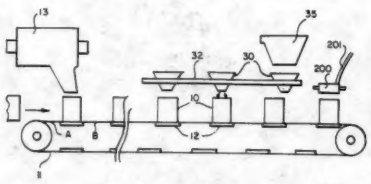
FILLING MACHINES

Timothy R. Pryor, Tecumseh, and Omer L. Hageniers, Windsor, both of Canada, assignors to Diffracto Ltd., Windsor, Canada

Filed Oct. 3, 1984, Ser. No. 657,259

Int. Cl.[4] B65B *1/04*

U.S. Cl. 141—1 **20 Claims**



1. An improved method of filling containers comprising the steps of,

loading fill material into at least one of a circulating series of weigh receptacles,

weighing the material in said weigh receptacles using electro-optical means while said receptacles are in continuous motion, and

dumping the fill in at least one of said receptacles into at least one container.

4,621,665

METHOD OF AND APPARATUS FOR SIMULTANEOUSLY FILLING THE CUP-SHAPED CAVITIES OF A MICROBEAKER PLATE

Leslie Webb, Düren-Echtz, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich GmbH, Julich, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,437

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410508

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—1 **12 Claims**

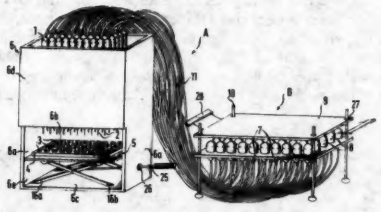
1. A method of simultaneously filling a set of cups with a liquid, comprising the steps of:

(a) placing above the cups a plurality of storage vessels which contain the liquid;

(b) aligning an outlet opening of each storage vessel with a respective one of the cups by adjusting the distance therebetween;

(c) increasing the pressure within each storage vessel by pressing against a respective elastic diaphragm which is individual to and operatively connected with the respective storage vessel so as to force liquid into each of the cups in excess; and

(d) releasing the pressure on the diaphragms so that the diaphragms return into their initial shape thereby drawing in excess liquid out of the cups back into the storage vessels for providing a predetermined liquid quantity within each of the cups.



4,621,666

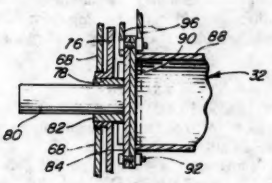
TWO WHEEL AGRICULTURAL FEED BAGGER

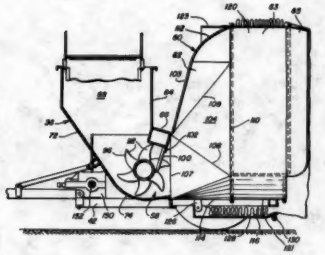
Kelly P. Ryan, Blair, Nebr., assignor to Kelly Ryan Equipment Co., Blair, Nebr.

Continuation of Ser. No. 597,107, Apr. 2, 1984, abandoned. This application Oct. 9, 1985, Ser. No. 785,763

Int. Cl.[4] A01F *25/16*; B65G *3/04*

U.S. Cl. 141—114 **35 Claims**





1. In an apparatus for loading feed stock into agricultural bags having a housing with a hopper, a passageway and a tunnel, an agricultural bag expandably affixed to said tunnel and having a closed end closing the mouth of the tunnel, a rotor rotatably mounted in said passageway, means for driving said rotor to move feed stock from the hopper through the passageway and into the tunnel and brake means for resisting relative movement between the loading apparatus and the closed end of the bag, the improvement comprising:

said tunnel having an expanded chamber comprised of a horizontal bottom wall, side walls diverging from said passageway and a back wall;

a forming chamber having an inlet end and an outlet end, joining with the expanding chamber and extending forwardly thereof, the cross-section of said forming chamber remaining uniform from the inlet end to the outlet end; and

a guide means joining with a leading edge of the forming chamber and converging inwardly whereby the rotor will force feed stock into the tunnel to completely fill the tunnel and the closed end of the bag, the pressure of the feed stock forced into the filled tunnel overcoming the loading on the brake means to urge the loading apparatus rearward as the rotor maintains the tunnel and the bag filled.

22. In a loading apparatus for loading feed stock into agricultural bags comprising:

a housing having a feed stock receiving hopper, a passageway communicating with the hopper and a tunnel communicating with the passageway, said tunnel supporting the open mouth of an agricultural bag to be filled, the improvement comprising

a rotor extending across the width of the passageway;

pairs of teeth radially mounted on the periphery of the rotor with axially adjacent pairs of teeth being offset circumferentially on the surface of the rotor;

a cross beam on the housing;

a plurality of prongs fastened to the undersurface of the cross beam with each prong extending between a pair of teeth and between the adjacent teeth of adjacent pairs of teeth; and

a radially extending flange on at least one end of the rotor;

a stub shaft extending through the wall of the passageway adjacent said flange and having a mating flange carried by the inner end of said stub shaft; and

means for securing the flange on the rotor to the flange on the stub shaft within the passageway whereby said rotor can be removed and serviced without removing the stub shaft from the housing.

4,621,667

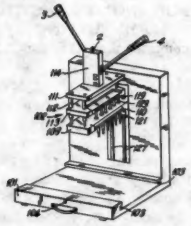
APPARATUS FOR THE EXTRACTING AND DEPOSITING OF MEASURED QUANTITIES OF LIQUIDS

Gunter Eberle, Gartenstr. 100, 7200 Tuttlingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 640,880, Dec. 15, 1975, abandoned. This application Jan. 14, 1985, Ser. No. 691,208

Int. Cl.[4] B65B *3/12*

U.S. Cl. 141—258 **6 Claims**



1. Apparatus for the extraction and delivery of measured quantities of liquids into receiving vessels arranged in rows in a frame mounted in a horizontally movable base plate and over which syringes are arranged side by side in bores on a liftable and lowerable holding plate, piston rods in the syringes being

operable together by means of an operating rod actuated by a liftable and lowerable member, characterized in that the operating rod passes through a bore in the liftable and lowerable member, a dosing lever is pivoted on the liftable and lowerable member and formed with a cam surface to engage a further cam surface, movement of the dosing lever tilting the liftable and lowerable member to drivingly engage the operating rod, subsequent pivoting of the dosing lever and engagement of the cam surfaces causing axial movement of the operating rod.

4,621,668

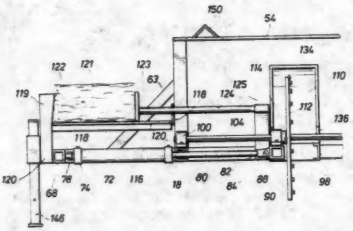
APPARATUS FOR REMOVING TREE STUMPS AND SPLITTING LOGS

Norman N. York, 616 Finfrock, Pasadena, Tex. 77506

Continuation-in-part of Ser. No. 581,917, Feb. 21, 1984, Pat. No. 4,530,385. This application Jul. 22, 1985, Ser. No. 758,167

Int. Cl.⁴ B27L *7/00*; B01C *1/04*

U.S. Cl. 144—3 K **10 Claims**



1. Tractor supported and operated stump removal and log splitter apparatus, comprising:

(a) a frame structure adapted to be supported, raised and lowered by a hitch structure of the tractor;

(b) slide means being positioned for guided reciprocal movement on said frame structure;

(c) means for imparting linear reciprocal movement to said slide means;

(d) a non-circular drive shaft being mounted for rotary movement on said frame structure and adapted to be driven by the power take-off of the tractor;

(e) a rotary cutter element being rotatably mounted on said slide means and movable along with said slide means, said rotary cutter element having means providing sliding, non-rotatable relation with said drive shaft, whereby said cutter element is rotated by said drive shaft and is capable of simultaneous linear movement; and

(f) log splitting means mounted on said frame structure for splitting a log positioned thereon.

4,621,669

PROCEDURE FOR PROLONGING TOOL LIFE IN WOOD CUTTING

Eero Kivimaa, Linnankoskenkatu 15, SF-02250 Helsinki 25, Finland

Filed Sep. 20, 1984, Ser. No. 652,825

Claims priority, application Finland, Sep. 26, 1983, 833446

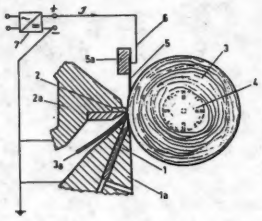
Int. Cl.⁴ B27L *5/00*

U.S. Cl. 144—365 **6 Claims**

1. A method for prolonging the service life of a wood-cutting machine when cutting green wood and comparable organic substances by limiting the dulling of the cutting component of the machine by electricity, said machine having a frame and said cutting component, said cutting component of said machine having a cutting edge and a cutting point, said method comprising

conducting a direct current from a source which has a positive and a negative terminal through green wood being cut and through the cutting point of the cutting edge of the cutting component in a direction through the green wood being cut, said green wood acting like an electrolyte, of the said of said direct current to the wood being cut over a contact, letting said direct current flow through said cutting component of said wood-cutting machine and other components of said wood-cutting machine and connecting the negative terminal of the said source of direct current to said frame of said wood-cutting machine and wherein said contact acts as the anode and said other components of said machine function as the cathode.

3. Apparatus for prolonging the service life of a wood-cutting machine when cutting green wood and comparable organic substances by limiting the dulling of the cutting component of the machine by electricity, said machine having a frame



and a cutting component mounted thereon, said cutting component of said machine having a cutting edge and a cutting point, said apparatus comprising a direct current source having a positive terminal and a negative terminal;

conducting means electrically connecting the negative terminal of said direct current source to said frame of said wood-cutting machine; and

additional conducting means electrically connecting the positive terminal of said direct current source to the green wood being cut, whereby said green wood acts like an electrolyte, direct current from said direct current source flowing through said cutting component of said wood-cutting machine and other components of said machine.

4,621,670

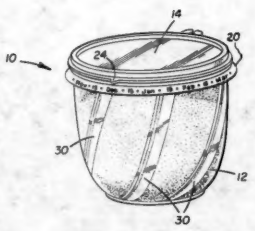
DATE INDEXED FOOD STORAGE CONTAINER

Tony Yuen, San Francisco, Calif., assignor to Lamarle, South San Francisco, Calif.

Filed Mar. 27, 1985, Ser. No. 716,643

Int. Cl.⁴ A47J *47/02*; B65D *43/02*; G09F *9/00*

U.S. Cl. 150—55 **2 Claims**



1. A date indexed food storage container comprising:

a base having a lower pedestal portion and an upstanding portion, said upstanding portion having an outwardly extending and downwardly angled flange adjacent to and integral with the upper perimeter of the upstanding portion, said flange having formed on the downwardly angled portion date indicia, said upstanding portion further having a substantially transparent area extending from the lower pedestal portion to the flange and having at least

one frosted surface capable of being written upon with a lead pencil; and

a cover, said cover having a perimeter and said cover further being non-rotatably fixable to said upstanding portion, said cover having an outwardly extending pointer on the perimeter thereon said cover fixable to said upstanding portion so that said indicia on the flange is generally readable from above perpendicularly and horizontally to said cover.

4,621,671

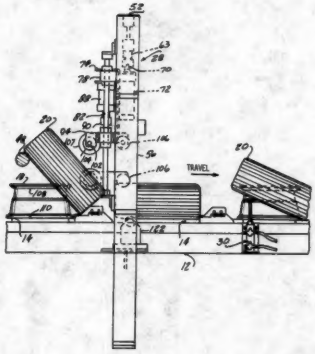
TIRE MOUNTING SYSTEM

John P. Kane, Sterling Heights; Daniel Cser, Detroit, and Robert H. Dall, Ann Arbor, all of Mich., assignors to Allied Automation Systems, Inc. and General Motors Corp., both of Detroit, Mich.

Filed Sep. 20, 1984, Ser. No. 652,272

Int. Cl.[4] B60C *25/00*

U.S. Cl. 157—1.1 **6 Claims**



1. An automatic tire mounting system comprising:

a conveyor;

a first feed means for placing a wheel having a pair of fixedly spaced rim flanges in a flat position on said conveyor for movement therewith;

a second feed means situated downstream from said first feed means for positioning a tire on said conveyor in an upright position immediately in front of said wheel;

roller means downstream of said second feed means for positioning said tire aslant before said rim and forcing the lower bead only of said tire between the rim flanges of said wheel as said tire and wheel are advanced by said conveyor past said roller means;

positioning means downstream of said roller means for placing said tire in a rearwardly aslant position on said wheel while maintaining the lower bead between said rim flanges;

mounting means downstream of said positioning means adapted to automatically force the upper bead of said tire between the rim flanges of said wheel as said tire and wheel are conveyed past said mounting means; and

inflation means for inflating the tire on said wheel.

4,621,672

MECHANISM FOR WINDOW BLIND

Pei-Shun Hsu, No. 373, Sec. 4, Yen Hai Road, Fu-Nan Tsun, Fu-Hsin Hsian, Chang-Hua Hsieng, Taiwan

Filed Jan. 18, 1985, Ser. No. 693,215

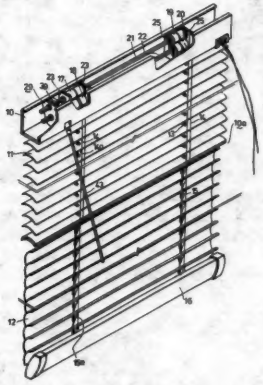
Int. Cl.[4] E06B *9/26*

U.S. Cl. 160—115 **3 Claims**

1. A window blind having a shade constituted of a plurality horizontal slats suspended from a long-shaped support and a mechanism for regulating the slats, wherein the mechanism comprises:

at least one first roller and at least one second roller mounted for rotation about two parallel horizontal axes in the support;

means for driving said first and second rollers separately, said driving means including two worm wheels coaxially mounted with said first and second rollers, respectively, two worms which are respectively put into mesh with said worm wheels, and a single means for operating both said worms;



at least one first regulating string attached to said first roller and extending downward on front and rear sides of said shade and having first cross-pieces attached thereto at regular intervals for regulating some of said slats;

and at least one second regulating string attached to said second roller and extending downward on front and rear sides of said shade and having second cross-pieces attached thereto at regular intervals for regulating the remaining slats;

said slats regulated by said first cross-pieces being placed above said slats regulated by said second cross-pieces.

4,621,673

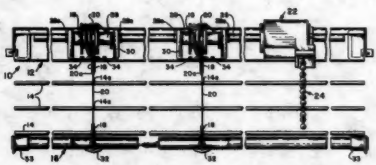
VENETIAN BLIND

George Georgopoulos, Pine Brook; Manuel Toledo, Union City, and Jorge Teran, West New York, all of N.J., assignors to Levolor Lorentzen, Inc., Lyndhurst, N.J.

Filed Oct. 26, 1983, Ser. No. 545,632

Int. Cl.[4] E06B *9/305, 9/38*

U.S. Cl. 160—168 R **7 Claims**



1. In a venetian blind: an elongated head rail; a plurality of parallel elongated slats below said head rail; an elongated bottom rail below said slats; a tilt rod rotatably mounted in said head rail; at least one pair of reel means mounted on said tilt rod for rotation therewith and in spaced relationship to each other; a clutch mechanism operatively connected to said tilt rod; means for engaging said clutch mechanism in one direc-

tion or the other to thereby rotate said tilt rod in one direction or the other; at least one pair of ladders extending respectively at locations below said pair of reel means, each ladder having a pair of side pieces of cord material and a plurality of rungs for respectively supporting said plurality of slats and having a bottom end connected to said bottom rail and a top end slidably received on the respective reel means; and at least one pair of lift tapes respectively at locations below said pair of reel means, each lift tape having a bottom end connected to the bottom end of the other lift tape, and a top end connected to the respective reel means; each lift tape being an extremely thin band having a wide side, and a narrow side narrower than the cord, each reel means including two disks axially spaced from each other a distance substantially corresponding to the wide side of the band, the respective band being wound onto or unwound from said reel means between said disks with the turns of the band neatly one on top of the other; each slat being provided with at least one pair of narrow slots respectively beneath said pair of reel means, each slot having its major extension transverse to the longitudinal extension of the respective slat and receiving therein the respective lift tape with the wide side thereof transverse to the longitudinal extension of the slat, and the narrow side thereof between the ladder side pieces and aligned therewith, and at least one pair of caps in said bottom rail at locations below said pair of reel means and respectively provided with openings for receiving therethrough the respective bottom end of the pair of lift tapes.

4,621,674

MEANS OF ANCHORAGE OF ANODE PINS OR STUBS IN A CARBON ANODE

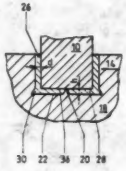
Horst Kaiser, Inzlingen, Fed. Rep. of Germany; Ulrich Heinzmann, Zumikon, Switzerland, and Alfred Sturm, Steinen-Hüsingen, Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jan. 16, 1984, Ser. No. 571,205

Claims priority, application Switzerland, Jan. 31, 1983, 534/83

Int. Cl.[4] B22D *19/04*

U.S. Cl. 164—103 **6 Claims**



1. Process for anchoring anode pins or stubs in carbon anodes for fused salt electrolytic cells which comprises forming a hole in said carbon anode to receive said anode pin or stub having floor and wall portions thereof, pre-heating said anode pin, placing said anode pin in said hole spaced from said floor and wall portions, pouring cast iron into said space whereby the cast iron heats the anode pin to over 400° C., wherein the mass of cast iron poured in is smaller than the mass of the lower part of the anode pin or stub to be enclosed and wherein the ratio of the mass of cast iron to the mass of the lower part of the anode pin or stub to be enclosed lies between 0.5:1 and 1:1.

4,621,675

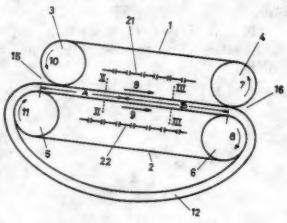
PROCESS AND APPARATUS FOR CONTINUOUS CASTING

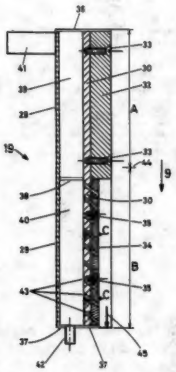
Yvon L. Vanelderen; Christian L. G. Raskin, both of Olen; René E. J. Mortier, Kasterlee, and John M. A. Dompas, Olen, all of Belgium, assignors to Hazelett Strip-Casting Corporation, Malletts Bay, Vt.

Continuation of Ser. No. 422,946, Sep. 24, 1982, abandoned. This application Jul. 9, 1985, Ser. No. 753,815

Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—481 **12 Claims**





1. A process for continuous casting according to which a moulding cavity is formed by means of moving walls having lower and upper walls formed by lower and upper revolving endless belts each having upper and lower runs, the lower wall being formed by the upper run of said lower endless belt, the upper wall being formed by the lower run of said upper endless belt and the side walls being formed by a pair of endless side dams, that move with the belts along the moulding cavity from the inlet to the outlet thereof and that are guided by a pair of fixed guides during their movement along the moulding cavity, each of said side dams has an inside surface and on outside surface, said outside surface is adjacent to the respective fixed guide which is guiding the respective moving side dam, the lower wall and the upper wall are cooled by contact with a cooling liquid, and molten metal is fed at the inlet of the moulding cavity and a cast product is delivered at the outlet of the moulding cavity, the side dams thus passing during their movement along the moulding cavity successively through a first zone, in which their inside surfaces face molten metal and through a second zone, in which their inside surfaces face solidified metal, this process being characterized by the steps of:

in said second zone providing a longitudinal channel extending along each respective fixed guide adjacent to the outside surface of the respective moving side dam,

providing an open end of each channel near the outlet of the moulding cavity,

circulating cooling fluid in at least a part of each of said fixed guides,

preventing the direct application to said side dams of the cooling fluid circulated in said fixed guides while said side dams are passing through said first zone,

spraying the cooling fluid from each of the fixed guides into the respective longitudinal channel and directly applied onto the outside surface of the respective side dam during at least a portion of the movement of each of the side dams through said second zone,

the cooling fluid being sprayed from the respective fixed guide into the longitudinal channel at multiple locations spaced along said channel in a direction that, seen from the inlet of the moulding cavity, forms an acute angle with the outside surface of the respective moving side dam,

said spraying direction at said multiple locations propelling the cooling fluid in the respective channel in a downstream direction toward said open end of the channel,

allowing the cooling fluid to escape through said open end of the channel, and

controlling the molten metal for controlling the length of the first zone for preventing the first zone from extending downstream beyond a predetermined limit for keeping said limit always upstream from said spraying,

thereby selectively cooling the outside surface of the side dams during travel along the moulding cavity to limit heating of the side dams as they are passing along the moulding cavity for enabling increase in the operating lifetime of the side dams and increase in the casting speed.

11. Continuous casting apparatus for casting molten metal wherein a moulding cavity having upper and lower walls is formed between two moving belts which respectively form the upper and lower walls of the moulding cavity, and the side walls are formed by a pair of endless side dams that move with the belts along the moulding cavity from the inlet to the outlet thereof, the upper and lower walls being cooled by liquid coolant, and molten metal being introduced into the inlet and a product is discharged from the outlet which is solidified at least on the outside thereof, the side dams thus passing during their movement along the moulding cavity successively through a first zone in which their respective inner surfaces face molten metal and a second zone in which they face solidifed metal, said apparatus comprising:

guide means extending along adjacent to the outer surface of the respective moving side dam for guiding the moving side dam along the moulding cavity and defining a longitudinal channel extending adjacent to the outer surface of the respective moving side dam along at least a portion of said second zone,

each longitudinal channel having an open end near the outlet of the moulding cavity,

liquid spray means including a plurality of liquid spray orifices located at spaced positions along the respective longitudinal channel, and

said spray orifices being aimed in directions that, as seen from the inlet of the moulding cavity form acute angles with the longitudinal channels for spraying liquid coolant directly onto the respective outer surface of the respective moving side dam as it moves along adjacent to said channel along said second zone and for propelling the liquid coolant in the longitudinal channel downstream toward the open end of the channel for escaping through said open end.

4,621,676

CASTING OF METALLIC MATERIALS

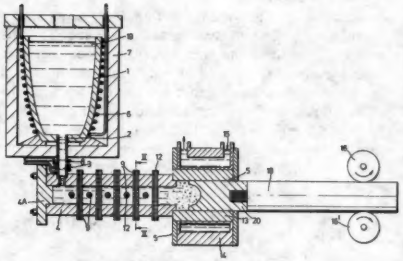
Neil D. Steward, Slough, England, assignor to The Secretary of State for Trade and Industry in Her Britanic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 22, 1984, Ser. No. 582,473

Claims priority, application United Kingdom, Feb. 23, 1983, 8305066

Int. Cl.⁴ B22D *11/124, 11/10*

U.S. Cl. 164—485 **7 Claims**



1. A process for casting a metallic alloy material of the type that exhibits a solidification range of temperatures comprising:

(a) directing a flow of a molten metallic material into a cooling duct that has therein one or more static elements which are arranged to lie across the path of the flow, at least one of the elements being a thermal conductor;

(b) allowing the flow of molten material to flow through and out of the duct at a rate sufficient to cause turbulence in the flow as it passes the one or more static elements;

(c) cooling the flow within the duct by abstracting heat from the at least one element that is a thermal conductor at a rate such that the temperature of the molten metallic material flowing out of the duct is between 0° C. and 75° C. above the liquidus temperature of the metallic material; and

(d) rapidly cooling the molten metallic material flowing out of the duct at such a rate that the metallic material solidifies to form a solid metallic material with substantially non-dendritic, rounded microstructure which when reheated to within its solidification range of temperatures exhibits thixotropic properties.

4,621,677

HEAT EXCHANGER FOR INTERNAL COMBUSTION ENGINE EXHAUST, WITH NOISE SUPPRESSOR

Shigeo Suzuki, Hirakata, and Tatsuo Fujita, Moriguchi, both of Japan, assignors to Kogata Gasu Reibo-Gijutsu Kenkyu Kumiai, Tokyo, Japan

Continuation of Ser. No. 612,806, May 22, 1984, abandoned. This application Feb. 4, 1986, Ser. No. 827,210

Claims priority, application Japan, May 25, 1983, 58-92923; Jun. 7, 1983, 58-102076; Jul. 20, 1983, 58-133170; Nov. 9, 1983, 58-210133

Int. Cl.⁴ F28F *13/08*

U.S. Cl. 165—135 **7 Claims**

1. A noise-suppressing heat exchanger, comprising:

wall means, including two opposite header end walls and a perimetrical sidewall, defining an enclosed gas flow space;

an outer shell completely, spacedly enclosing said wall means of said gas flow space so as to define a liquid jacket substantially completely surrounding said gas flow space;

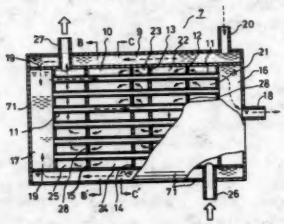
said wall means including means mechanically supporting said wall means relative to said outer shell;

a plurality of liquid flow pipes extending generally parallel

to one another, each having opposite ends opening through respective of said opposite end walls of said wall means, into said liquid jacket;

means defining a liquid inlet through said outer shell into said liquid jacket and a liquid outlet from said liquid jacket through said outer shell, the liquid inlet and liquid outlet being so arranged that a relatively cool liquid which is to be heated may be introduced into the liquid jacket via said liquid inlet, traverse said gas flow space within said tubes while being warmed by indirect heat exchange with a relatively hot gas flowing in said gas flow space, re-enter said liquid jacket and flow out said liquid outlet as a relatively warmed liquid;

means defining a gas inlet through said outer shell, said liquid jacket and said wall means into said gas flow space and a gas outlet from said gas flow space through said liquid jacket and said outer shell, the gas inlet and gas outlet being so arranged that a relatively hot gas which is to be cooled may be introduced into said gas flow space via said gas inlet, traverse said gas flow space externally of said tubes while being cooled by indirect heat exchange



with said relatively cool liquid and flow out said gas outlet as a relatively cooled gas;

a plurality of partition walls disposed in said gas flow space at a respective plurality of locations intermediate said two opposite end walls, with said liquid flow pipes penetrating said partition walls; these partition walls, with said wall means, dividing said gas flow space into a plurality of serially adjoining compartments; at least two of said partition walls being so spatially disposed relative to said wall means and to one another as to provide that said compartments of said gas flow space are of at least three different sizes; and

means defining at least one small hole through each partition wall, these small holes being so sized and located as to ensure that said gas in traversing said gas flow space must travel externally crosswise as well as externally lengthwise of said liquid flow pipes, and undergo multi-stage expansion,

whereby noise emanating from said gas is muffled by a combination of enclosure by said liquid in said liquid jacket, and attenuation by flowing successively through said at least three different-sized compartments.

4,621,678

HEAT EXCHANGER APPARATUS FOR EXTRUDING THERMOPLASTIC COMPOSITIONS

Granville J. Hahn; Raleigh N. Rutledge, both of Big Spring; Alonzo H. Searl, and Walter E. Sommerman, both of Fort Worth, all of Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 416,811, Sep. 13, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 585,658

Int. Cl.[4] **F25B** *29/00;* **F28F** *27/02;* **B30B** *15/34;* **B29C** *45/72*

U.S. Cl. 165—27 **5 Claims**

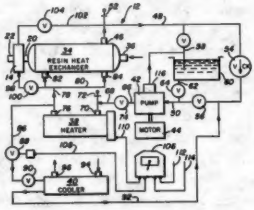
1. Heat exchange apparatus for controlling the temperature of an extruded heat-plastified resin after leaving the extruder and prior to extrusion through a die in an extrusion process, comprising:

a heat exchanger having an inlet and an outlet for the extruded heat-plastified resin and an inlet and an outlet for a heat exchange medium to be circulated in a heat exchanging relationship with the extruded resin;

a selective heater connected with said exchanger and receiving the heat exchange medium from said heat exchanger, said heater heating the heat exchange medium to a predetermined temperature;

a cooler including an inlet connected to said heater upstream of said heat exchanger for receiving a portion of the heat exchange medium from said heater, said cooler including an outlet for the heat exchange medium and an inlet and an outlet for a cooling medium to be circulated in heat exchanging relationship with the heat exchange medium;

temperature sensing means for transmitting a signal proportional to the temperature of said heat exchange medium;



control means between said heater and said cooler for selectively directing a portion of the heat exchange medium to said cooler in response to said temperature signal and for directing the balance of the heat exchange medium to said heat exchanger;

a pump having an inlet connected to the outlet for said heat exchange medium in said heat exchanger and to the outlet for said heating exchange medium in said cooler and having an outlet connected to the inlet for said heat exchange medium in said heater for circulating the heat exchange medium among said heat exchanger, said heater and said cooler; and

conduit means for connecting said pump, heat exchanger, heater and cooler and for carrying said heat exchange medium among said pump, heat exchanger, heater and cooler.

4,621,679

WATER SYSTEM VALVE FOR DRAINING HEAT EXCHANGERS

Hugo A. Byers, 622 S. Lake St., Amherst, Ohio 44001, and Fred D. Solomon, 3255 Stony Hill Rd., Medina, Ohio 44256

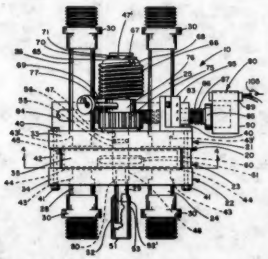
Filed Aug. 2, 1982, Ser. No. 404,553

Int. Cl.[4] **B60H** *1/00;* **F24J** *2/40;* **F27F** *27/00*

U.S. Cl. 165—39 **16 Claims**

1. A water temprature control system comprising a heat exchanger, a tank, and a pump for circulating heat transfer fluid through a supply line from the tank to the heat exchanger and through a return line from the heat exchanger to the tank, valve housing means interposed in both the supply line and the return line having supply inlet and supply outlet connections, having return inlet and return outlet connections, and having first and second drain connections, valve element means associated with said valve housing means having a first position for normally circulating the heat transfer fluid from said supply inlet connection to said supply outlet connection and from said return inlet connection to said return outlet connection and having a second position discontinuing circulation through said supply inlet connection and said return outlet connection and connecting said supply outlet connection to said first drain connection and said return inlet connection to said second

drain connection, and orifice means in each of said drain connections directly communicating with the atmosphere for insuring drainage of the heat exchanger in said second position of said valve element means, and means for moving said valve



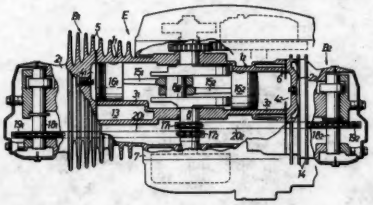
element means to said second position upon the occurrence of any of a reduction in the ambient temperature proximate the heat exchanger below a predetermined value, a loss of power to the valve and a malfunction of the valve.

4,621,680

COOLING SYSTEM FOR MOTORCYCLE ENGINE

Kunio Funabashi, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 533,856
Claims priority, application Japan, Sep. 29, 1982, 57-170744
Int. Cl.[4] B62K *11/04*; F01P *9/04*
U.S. Cl. 165—44 **11 Claims**



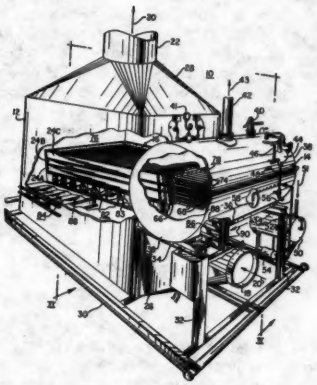
1. In a motorcycle engine equipped with a front engine block and a rear engine block arranged on a vehicle body in its longitudinal direction, each engine block including a cylinder and a cylinder head, the improvement comprising a cooling system for the engine in which the front and rear engine blocks include different means of cooling including cooling fins on said front engine block for air-cooling the front engine block, a water jacket means on said rear engine block for water-cooling the rear engine block, a radiator connected to said water jacket means on said rear engine block and pump means for circulating water between the radiator and water jacket means, the air cooled front engine block being devoid of a water jacket means and being separate from and independent of said radiator.

4,621,681

WASTE HEAT BOILER

George M. Grover, Los Alamos, N. Mex., assignor to Q-dot Corporation, Dallas, Tex.

Continuation of Ser. No. 849,987, Nov. 9, 1977, Pat. No. 4,482,004. This application May 19, 1983, Ser. No. 496,234
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—47 **3 Claims**



1. Apparatus for recovering heat comprising:

a housing defining a convection heat transfer chamber having an inlet duct for receiving a flowing stream of heated gas into a lower region of said chamber and an outlet duct for discharging said stream of heated gas from an upper region of said chamber;

a generally cylindrical boiler tank disposed adjacent said housing, said boiler tank having its cylindrical axis disposed generally normal to the direction followed by said stream of heated gas flowing through said chamber, said boiler tank including a water inlet port, a steam discharge port, and a generally rectangular header plate opening formed in a cylindrical sidewall portion of said boiler tank adjacent said housing, a generally rectangular header plate disposed in sealed engagement with said cylindrical sidewall portion defining said header plate opening, said header plate having a plurality of heat pipe openings extending therethrough for receiving a plurality of heat pipes; and,

a plurality of heat pipes thermally interconnecting the interior of said boiler tank with said chamber, said heat pipes being inclined at an angle in the range of about 15° to about 35° with respect to the horizontal and including an evaporator section disposed within an intermediate region of said chamber within the flowpath of said stream of heated gas and a condenser section disposed within the interior of said boiler tank, said heat pipes each comprising an elongated tubular envelope having a first sealed end portion terminating within said chamber, a second sealed end portion terminating within the interior of said boiler tank, and an intermediate portion projecting through said header plate and disposed in sealing engagement with the portions of said header plate defining said heat pipe openings, said end portions being free to expand axially in said chamber and the interior of said boiler tank, respectively, a fluid flowpath interconnecting the evaporator and condenser sections of said heat pipes to permit the flow of liquid and vapor between said sections, a volume of working fluid disposed within each heat pipe having a vapor phase and a liquid phase at the operating temperatures of said evaporator and condenser sections, respectively, and a liquid phase return conduit disposed in said tubular envelope for conveying working fluid in liquid phase from

said condenser section to said evaporator section and through said intermediate portion of said heat pipe;

said chamber is defined by said housing in combination with the evaporator sections of said heat pipes to form a relatively open bypass flowpath around said evaporator sections and a principal flowpath through which said heated gas passes in thermal contact with said evaporator sections, and said apparatus further includes a bypass damper assembly disposed in said bypass flowpath intermediate said inlet and outlet ducts, a face damper assembly disposed in said principal flowpath intermediate said inlet duct and said evaporator sections of said heat pipes, each damper assembly including a plurality of vanes pivotally mounted on said housing for selectively opening or closing each flowpath, respectively; and,

an ambient air damper assembly opening into said chamber upstream of said face damper assembly and operable to selectively admit ambient air into said chamber to reduce the temperature of said stream of heated gas flowing through said evaporator sections.

4,621,682

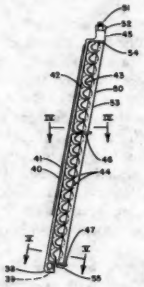
TUBE SUPPORT ASSEMBLY FOR A HEAT EXCHANGER

William B. Jennings, Collierville, Tenn.; Robert M. Kozlowski, Syracuse, and Richmond S. Hayes, Jr., Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 450,705, Dec. 17, 1982, Pat. No. 4,492,269. This application Oct. 31, 1984, Ser. No. 645,900

Int. Cl.[4] F28F *9/00*; F28D *1/04, 7/04*; F25B *39/04*

U.S. Cl. 165—76 **6 Claims**



1. A tube support assembly for securing loops of wound fin tubing in an inclined configuration which comprises:

a support member having a partition end portion an opening and a back portion extending at an inclined angle relative to the axis of said opening in said end portion, and at least one extension portion spaced from said partition end portion and defining a rod slot having means to snap fit a rod therein, said partition end portion and said at least one extension portion extending from the same side of said back portion; and

tubular support rod sized to extend through the opening in the partition end portion and to snap fit into the rod slot of said at least one extension portion and includes an end portion which extends through the opening in the partition end portion and a body portion angled from the end portion and being generally parallel to the back portion of the support member when snap fit into said rod slot, the loops of tubing being secured between the tubular support rod and the support member.

4,621,683

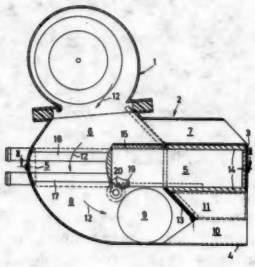
HEAT EXCHANGER WITH VALVED PIPE CONNECTION

Rudiger Knab, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 474,992, Mar. 14, 1983, abandoned. This application Jun. 3, 1985, Ser. No. 740,793

Int. Cl.[4] F28D *11/00*; F28F *5/00*

U.S. Cl. 165—86 **2 Claims**



1. A heating and ventilating unit for motor cars having air temperature regulation by a heat exchanger which may be variably slid into a fresh air stream and the operative surface of which is variably acted upon in a defined constant position approximately at right angles to the fresh air stream from a cold position substantially within a heat-insulated space into a hot position across the said fresh air stream, and a blower operatively associated with the air stream characterized in that the heat exchanger includes a casing and a water compartment and receives a connecting pipe axially secured in the casing by an attachment flange and projecting into its water compartment, the pipe being provided with openings which are closed by a collar carried within the water compartment when the heat exchanger is moved into its cold position.

4,621,684

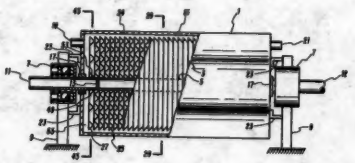
ROTARY HEAT EXCHANGER WITH CIRCUMFERENTIAL PASSAGES

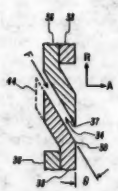
Terry W. Delahunty, Rte. 1, Box 80, Tioga, Tex. 76271

Filed Jan. 22, 1985, Ser. No. 693,336

Int. Cl.[4] F28F *5/00*

U.S. Cl. 165—92 **8 Claims**





1. A rotary heat exchanger for affecting indirect countercur-

rent and cocurrent heat exchange between a plurality of fluid streams, which comprises:

(a) circular shaped finned discs fabricated from heat conducting materials and configured with internal circumferential passages spaced in annular array;

(b) finned discs coaxially aligned and affixed to a support means which facilitates rotation in predetermined direction and speed about a central axis;

(c) said support means with internal conduit means for separately conveying designated fluid streams to and from said heat exchanger;

(d) said support means with orifices for separately conveying designated fluid streams to and from two manifold finned discs;

(e) said manifold finned discs being said finned discs further configured with manifolding channels generally extending radially to and from said orifices and communicating with circumferential passages provided for designated fluid streams;

(f) said manifold finned discs further confingured with axial flow apertures permitting axially directed flow of designated fluid streams singularly to and singularly from circumferential passages provided for designated fluid streams;

(g) said manifold finned discs further configured with separate circumferential passages provided for primary fluid streams, arranged in radially disposed alternating placement with the circumferential passages for designated fluid streams;

(h) said manifold finned discs further configured with axial flow apertures permitting axially directed flow of primary fluid streams to and from circumferential passages provided for primary fluid streams;

(i) a rotary heat exchanger element formed by materially joining in radially sealed relationship and in functional alignment and facial orientation two manifold finned discs one to another;

(j) predetermined and selected apertures configured with means to accelerate fluid streams in a direction substantially parallel with the direction of the central axis and at substantially right angles to the tangential velocity component induced by heat exchange interaction between the streams and the walls of the rotative circumferential passages;

(k) said predetermined and selected apertures further configured with a directing means which alters fluid streams flow directions and thereby reduces the magnitude of the tangential velocity components and promoting entry of the fluid streams into the proximate circumferential passages;

(l) an enclosure affixed to a stationary support means, having inlet and discharge ports for flow of primary streams, having peripheral sealing means around the circular surface of the rotative heat exchange element, and having space provisions for primary streams flow between the rotative heat exchange element and said ports.

4,621,685

HEAT EXCHANGER COMPRISING CONDENSED MOISTURE DRAINAGE MEANS

Kazuo Nozawa, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,457

Claims priority, application Japan, Oct. 29, 1983, 58-168093[U]

Int. Cl.⁴ F28B *3/00*

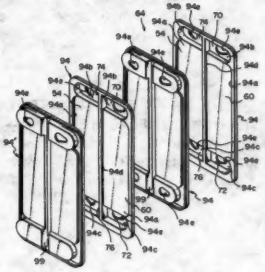
U.S. Cl. 165—111 **3 Claims**

1. A multiple pass heat exchanger comprising:

a plurality of hollow panels arranged in a stack with corrugated plates interspersed therebetween and each having a fluid passageway therein and an upper header and a lower header at opposite sides of said fluid passageway, said upper and lower headers being fixed to upper and lower headers of adjacent hollow panels and perforated to communicate respectively with the upper headers and lower headers of adjacent hollow panels;

the fluid passageways and upper and lower headers being interconnected in such a manner that fluid flows therethrough in a multiple pass zig-zag pattern;

drain means for draining water which deposits on said panels



as a result of condensation of moisture contained in air flowing through said stack; and

a sump for collecting the drained water;

said drain means comprising vertically extending drain channel means defined between outer surfaces of the upper and lower headers of adjacent hollow panels which face each other.

4,621,686

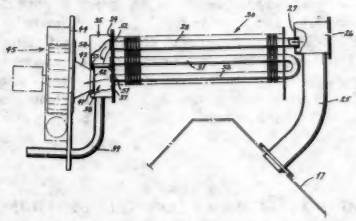
WATER VAPOR-CONDENSING SECONDARY HEAT EXCHANGER

Hongsik Ahn, Chesterfield, Mo., assignor to Intertherm, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 568,382, Jan. 5, 1984, Pat. No. 4,478,206. This application Sep. 28, 1984, Ser. No. 655,448

Int. Cl.⁴ F28B *9/08*

U.S. Cl. 165—113 **3 Claims**



1. For use in a furnace of the type which burns fuel yielding water vapor as a product of combustion, and including a casing having a substantially vertical path portion for air to which heat is to be exchanged, a water vapor-condensing heat exchanger comprising a hot combustion gas manifold extending substantially horizontally along one side of such vertical path portion, an intermediate manifold extending substantially parallel thereto along the opposite side of such vertical path portion at a lower elevation, a collector manifold extending substantially parallel to and directly underneath said intermediate manifold, a single heat exchange coil made up of a first set of heat exchange tubes having inlet ends connected to the hot gas manifold and extending at a downward slope therefrom across such vertical path portion to outlet ends within said intermediate manifold, a second set of heat exchange tubes extending from inlet ends within said intermediate manifold, reversingly across such vertical path portion and at an upward slope parallel to said first set of tubes, to outlet ends, to which are con-

nected the inlet ends of a third set of heat exchange tubes which extend reversingly across such vertical path portion sloping downward and somewhat below and parallel to said second set, to lowermost outlet ends within said collector manifold, said coil having a set of heat exchange fins common to said first, second and third sets of tubes, means at said collector manifold to apply suction to said lowermost outlet ends of said third set of tubes, and means to drain condensate from combustion interruptedly from both said collector manifold and said intermediate manifold.

4,621,687

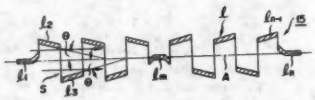
FLAT TUBE HEAT EXCHANGER HAVING CORRUGATED FINS WITH LOUVERS

Shiro Ikuta, Tokyo, and Koji Homma, Sano, both of Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1984, Ser. No. 659,651

Int. Cl.[4] F28F *1/22*

U.S. Cl. 165—152 **14 Claims**



1. In a heat exchanger having corrugated fins having a plurality of louvers connected by U-shaped bends and a liquid tube structure having a plurality of flat, parallel, radiating surfaces with the U-shaped bends of said corrugated fins juxtaposed to and in heat-transfer contact with the radiating surfaces; the improvement in which: said louvers are formed from a plurality of substantially parallel fin plates which are normal to said radiating surfaces and have juxtaposed louver-blade-forming portions alternately projected above and below the base plane of each fin plate, thereby forming a plurality of louver blades alternating above and below said base plane; at least in the front part of said louvers, said blades are so arranged that the states of inclination thereof relative to said base plane vary alternately, those above said plane sloping down toward said plane at an angle in the direction of the outlet end and those below said plane sloping up toward said plane at a like angle and in the same direction; and said louver blades have a spacial arrangement such that there are uninterrupted lines of sight from one end to the other, one line of sight being above said base plane and another line of sight being below said base plane.

4,621,688

CLAMPING JAW DEVICE FOR WELL SERVICING MACHINE

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 344,626, Feb. 1, 1982, Pat. No. 4,429,743. This application Jan. 18, 1984, Ser. No. 571,736

The portion of the term of this patent subsequent to Feb. 7, 2001, has been disclaimed.

Int. Cl.[4] E21B *43/25*; F16B *7/00*; F16D *1/08*

U.S. Cl. 166—75.1 **4 Claims**

1. In a well servicing system for generating and feeding sonic energy down a pipe string to a down hole work area, said system including an orbiting mass oscillator for generating the sonic energy, the improvement being a clamping jaw device for removably coupling the oscillator to the pipe string comprising:

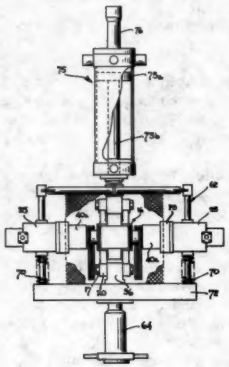
a pair of similar clamping jaws, each of said jaws forming a longitudinal half section of a hollow cylinder and having a head portion, a main body portion, a neck portion indented from said head portion joining the head portion to one end of the main body portion and a flange at the other end of the main body portion,

a ring-shaped flange plate assembly fitted under said head portion and around said neck portion,

stem member means coupled to said oscillator,

said flange plate assembly connecting said jaws to said stem member means, and

jaw lock member means for retaining the jaws together in clamping engagement against the top end of the pipe string with said pipe string inserted between the jaws, said



jaw lock member means comprising a flat ring member having an inside diameter at least as great as the outside diameter of the main body portion and slidably mounted on the main body portion and adjustably positionable therealong, said jaw lock member means being seated against the flange at the other end of the main body portion to hold the jaws in a closed clamping position against the pipe string.

4,621,689

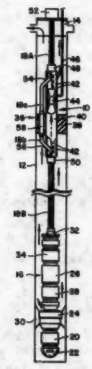
CABLE SUSPENDED SUBMERGIBLE PUMPING SYSTEM WITH SAFETY VALVE

Earl B. Brookbank, III, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Filed Sep. 4, 1985, Ser. No. 772,472

Int. Cl.[4] E21B *43/12*

U.S. Cl. 166—106 **5 Claims**



1. A cable suspended pumping system comprising a downhole pumping unit including a submergible pump and an electric motor for driving the pump, cable means for suspending

the pumping unit downhole and having one end provided with means for connection to the pumping unit and an opposite end provided with means for connection to a wellhead, said cable means including a weight-bearing portion and an electric current conducting portion, a pack-off assembly including a packer and a tube extending therethrough and sealed therein, said packer being adapted to divide a well into an upper region and a lower region, said tube having a perforated lower portion and a perforated upper portion, whereby pumped fluid may enter the tube at the lower region, pass through the packer via the tube, and exit the tube at the upper region, a subsurface safety valve in the tube having a safety valve operating line extending from the safety valve to the wellhead, whereby a flow passage through the tube may be opened and closed at will independent of the operation of the pump, and means for electrically connecting a section of the electrical conductor portion of the cable means that is above the packer to a section of the electrical conductor portion of the cable means that is below the packer, the section of the cable means that is above the packer being substantially shorter than the section that is below the packer so that the subsurface saftey valve is readily accessible from the wellhead.

4,621,690

SUCKER ROD COUPLING

Albert A. Klyne, Edmonton, Canada, assignor to Diversified Drilling Services Ltd., Leduc, Canada

Filed Apr. 12, 1985, Ser. No. 722,848
Int. Cl.[4] E21B *17/10*
U.S. Cl. 166—241 **4 Claims**

1. An anti-friction sucker rod coupling for connecting a pair of sucker rods and centralizing then in a tubing string, comprising:

an elongate, rigid, substantially cylindrical body member, each end of said body member forming means for threadably connecting said body member with a sucker rod, said body member further forming a transversely extending, substantially diametric, generally vertical slot extending therethrough, said body member further forming a pin bore, such pin bore extending transversely through the body member so as to intersect the slot substantially perpendicularly;

a wheel member positioned within the slot to rotate in a generally vertical plane, said wheel member having a portion thereof extending beyond the periphery of said body member to engage the inner surface of the tubing string and centralize the coupling;

and a pin mounted in said pin bore and supporting member thereon, whereby the wheel member is rotatable within said slot;

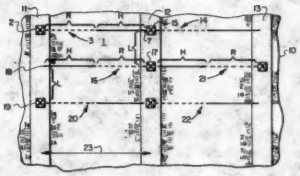
said wheel member having sufficient clearance between its side surfaces and the wall surfaces of the slot, when the wheel member is centered in the slot on the pin, whereby the wheel member may shift along the pin to assist in ejecting sand and oil from the slot.

4,621,691

WELL DRILLING

Frank J. Schuh, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 8, 1985, Ser. No. 752,755
Int. Cl.[4] E21B *43/16, 7/06, 43/30*
U.S. Cl. 166—268 **3 Claims**



1. In a method for drilling a plurality of wellbores in at least one producing formation in an oil and/or gas field for maximum development of said field with the least number of wellbores, the improvement comprising providing at least two spaced apart longitudinally extending drilling zones which are essentially parallel to one another, said at least two drilling zones extending across a substantial portion of said field, drilling a first downwardly extending wellbore from a first site on a first of said drilling zones, said first wellbore curving toward the second of said drilling zones, straightening said first wellbore when it reaches a predetermined producing formation, continuing to drill said first wellbore along said predetermined producing formation toward said second drilling zone, terminating said first wellbore in the vicinity of said second drilling zone, drilling a second downwardly extending separate wellbore which is unconnected with said first wellbore from a first site on the second of said drilling zones, said first site on said second drilling zone being longitudinally displaced from said first site on said first drilling zone, said second wellbore curving toward said first drilling zone, straightening said second wellbore when it reaches the same predetermined producing formation, continuing to drill said second wellbore along said predetermined producing formation toward said first drilling zone, terminating said second wellbore so that it remains separate from and unconnected with said first wellbore and in the vicinity of said first drilling zone, and continuing the alternate drilling of longitudinally spaced apart curving wellbores along said first and second drilling zones for a substantial length of said drilling zones.

4,621,692

WATER SOLUBLE PERFORATION PACK

Thomas C. Mondshine, Houston, Tex., assignor to Texas United Chemical Corp., Houston, Tex.

PCT No. PCT/US85/00535, § 371 Date Jun. 27, 1985, § 102(e) Date Jun. 27, 1985
PCT Filed Mar. 28, 1985, Ser. No. 756,982
Int. Cl.[4] E21B *33/138, 43/02*
U.S. Cl. 166—281 **10 Claims**

1. In a well completion and workover method wherein a subterranean formation in a well is perforated to provide channels for fluids within said formation to flow to the well bore, the steps comprising:

(a) pumping a first treating fluid into the well and contacting said perforation channels with said first treating fluid,

wherein said first treating fluid comprises a saturated aqueous saline solution with at least one water soluble particulate sized salt which is substantially insoluble in said saturated aqueous saline solution;

(b) filling said perforation channels with said water soluble particulate sized salt which is substantially insoluble in said first treating fluid, wherein said water soluble particulate sized salt has a particle size range such that said perforation channels filled with said water soluble salt have a permeability sufficiently high to affect the easy removal of said water soluble particulate sized salt from said perforation channels when desired;

(c) forming a bridge and seal on the surface of said filled perforation channels to bridge and seal off the filled perforation channels by contacting said filled perforation channels with a second treating fluid, wherein said second treating fluid comprises a saturated aqueous saline solution in which the water soluble particulate sized salt filled within said perforation channels is substantially insoluble having suspended therein at least one particulate bridging material having a particle size range such that a low permeability seal of said filled perforation channels is obtained; and thereafter when desired;

(d) removing said low permeability seal from the surface of said filled perforation channels; and

(e) removing said water soluble particulate sized salt from within said perforation channels by dissolving said water soluble particulate sized salt in a third treating solution in which said water soluble particulate sized salt is soluble.

4,621,693

APPARATUS AND METHODS FOR PUMPING SOLIDS AND UNDESIRABLE LIQUIDS FROM A WELL BORE

Donald B. Caldwell, Enid, and Robert J. Spring, Oklahoma City, both of Okla., assignors to The Adaptable Tool Company, Oklahoma City, Okla.

Continuation of Ser. No. 491,309, May 3, 1983, abandoned. This application Jun. 26, 1985, Ser. No. 750,050

Int. Cl.[4] E21B *37/00*

U.S. Cl. 166—311 **12 Claims**

1. An apparatus for removing debris, including solids and liquids, from a well bore comprising:

a vertically extending elongate string connectable to a source of reciprocating and rotating motion and having an open lower end, the string including:

a debris retaining portion having an outlet and an inlet;

a debris retaining check valve positioned below said debris retaining portion to close said inlet;

a downhole pump in fluid communication with the outlet of said debris retaining portion, said downhole pump including a cylinder, a ported piston and a hollow piston rod, said piston connected by said hollow piston rod to the outlet of said debris retaining portion, and said cylinder retained in said elongate string for reciprocation upwardly and downwardly around said piston at a time when said piston and the debris retaining portion connected thereto by said hollow piston rod rest upon, or are in contact with, solids-containing debris located immediately therebelow, said cylinder including a lower end slidably engaging said piston rod and keyed to said piston rod for mutual and concurrent rotary motion with said piston rod about the longitudinal axis of the piston rod whereby, when said cylinder undergoes rotary motion, such rotary motion is imparted to said hollow piston rod;

an upper portion of said string communicating with said pump and connectable to said source of reciprocating and rotating motion at the upper end of said upper portion of said string, and to said cylinder at the lower end of said upper portion of said string, said cylinder having a lower end portion slidably engaged with, and keyed to, said piston rod to communicate a rotating motion of said upper portion via said piston rod to said debris retaining portion located below said downhole pump;

said piston rod and piston including an internal elongated passageway open and unobstructed from one end thereof to the other and establishing fluid communication between the upper end portion of said cylinder and said debris retaining portion;

a second check valve located above said piston and above said cylinder in said upper portion of said string for permitting flow through said passageway, through said ported piston, through said cylinder, and through said second check valve into said upper portion of said string at a location above said second check valve, and to prevent fluid flow in the reverse direction; and

a liquid chamber connected to the upper end of said cylinder and located over said pump and in fluid communication with said unobstructed passageway for collecting liquid pumped upwardly by said pump, said liquid chamber being detachably and removably connected in said elongate string.

8. A method for removing debris having a solid component and a liquid component from deep in a well bore comprising:

assembling an elongated tool string dimensioned for extension into the well bore, said tool string including a tubular lower debris collecting portion, an upper portion, and a pump disposed between said debris collecting portion and said upper portion, said pump including:

a hollow piston rod having a lower end connected to the upper end portion of said lower debris collecting portion, and having an upper end;

a piston connected to the upper end of said piston rod and having an opening therethrough aligned with the hollow interior of said hollow piston rod for receiving fluid from said hollow piston rod; and

a cylinder slidingly enclosing said piston, and having an upper end portion connected to said tool string upper portion for moving up and down in said well bore with said upper portion, and for rotation within said well bore about the axis of said well bore with said tool string upper portion;

extending the elongated string as thus assembled into said well bore until the lower debris collecting portion disposed at the lower end of the string is in the debris;

reciprocating the upper portion of the tool string with respect to the debris collecting portion to cause movement of said cylinder up and down while the piston contained therein remains stationary to thereby pump the debris from the well into the debris collecting portion;

continuing to reciprocate the upper portion of the string with respect to the debris collecting portion to thereby pass the liquid component of the debris through the piston rod and piston and then into the upper portion of said

cylinder above said piston, and then from said cylinder into said tool string upper portion;

periodically rotating the tool string to loosen the debris outside of, and at the lower end of, said tool string; and

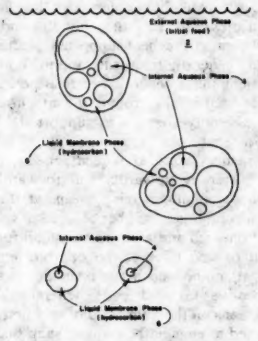
elevating the upper portion of said tool string periodically by an amount to bring the lower end portion of said cylinder into forceable contact with said stationary piston as said cylinder is moved upwardly, and thereby break free said relatively low mass, which includes said piston, hollow piston rod and debris collecting portion, from said debris by imparting a jarring motion in an upward direction to said piston, piston rod and lower debris collecting portion.

4,621,694

USE OF A LIQUID MEMBRANE FOR SCALE REMOVAL

Peggy M. Wilson, Dallas, and Ernest L. Muegge, Grand Prairie, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 30, 1985, Ser. No. 770,928
Int. Cl.[4] E21B *37/00, 37/08*
U.S. Cl. 166—312 **23 Claims**



12. A liquid membrane method for removing scale contained within wellbores and equipment affixed thereto used in the production of hydrocarbonaceous fluids comprising:

(a) removing hydrocarbonaceous fluids from said wellbore and equipment;

(b) preventing the intrusion of additional hydrocarbonaceous fluids within said wellbore;

(c) placing within said wellbore and equipment an emulsion containing an external aqueous phase and an immiscible liquid hydrocarbonaceous membrane phase enveloped around droplets of an internal aqueous phase;

(d) contacting said scale contained within said wellbore and equipment with said external aqueous phase which causes said scale to solubilize into scale-forming ions in said external aqueous phase;

(e) transferring said ions from said external aqueous phase into said hydrocarbonaceous membrane phase which contains a first complexing agent for reacting with said scale forming ions;

(f) transferring and concentrating said scale forming ions from said hydrocarbonaceous membrane phase into said internal aqueous phase which has a stronger second complexing agent than said first complexing agent;

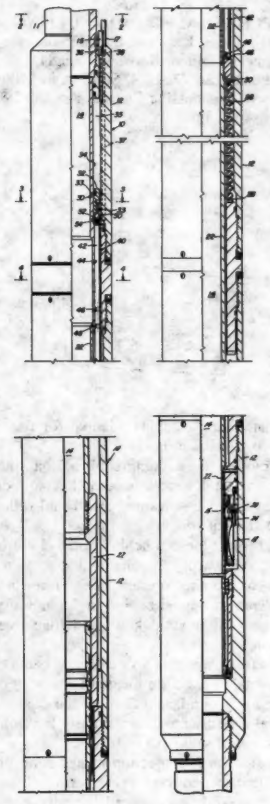
(g) continuing the transfer of said ions from said scale into said external aqueous phase into said hydrocarbonaceous membrane phase and then into said internal aqueous phase where said ions are concentrated for a time sufficient to remove substantially all scale from said wellbore and equipment.

4,621,695

BALANCE LINE HYDRAULICALLY OPERATED WELL SAFETY VALVE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Aug. 27, 1984, Ser. No. 644,183
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—321 **5 Claims**



1. In a well safety valve for controlling the fluid flow through a well conduit and including a tubular housing and a valve closure member moving between open and closed positions, a longitudinal tubular member telescopically movable in the housing for controlling the movement of the valve closure member, means for biasing the tubular member in a first direction for causing the valve closure member to move to the closed position, a piston and cylinder assembly positioned in the housing for moving the tubular member, one side of the assembly adapted to be connected to a hydraulic control line extending to the well surface for moving the valve closure member to the open position, the other side of the assembly adapted to be connected to a hydraulic balance line extending to the well surface for compensating for the hydrostatic pressure in the control line, the improvement comprising,

a check valve providing communication of hydraulic fluid from the balance line to the control line for purging the balance line of any gas, but preventing communication of

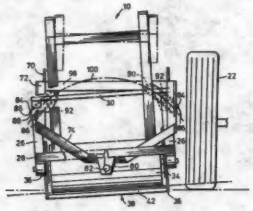
hydraulic fluid from the control line to the balance line whereby the assembly may be actuated to open the valve.

4,621,696

PIVOT MECHANISM FOR SOD CUTTING MACHINE

Gerardus J. Brouwer, Keswick, Canada, assignor to Brouwer Turf Equipment Limited, Keswick, Canada

Filed Mar. 27, 1984, Ser. No. 594,000
Claims priority, application Canada, Feb. 20, 1984, 447786
Int. Cl.[4] A01B *45/04*
U.S. Cl. 172—20 8 Claims



1. A sod harvesting machine adapted for travel forwardly along a path of travel and having:

(a) a sod cutting head comprising a first frame, a roller mounted on said first frame, and a sod cutting knife mounted on said first frame behind said roller for undercutting a strip of sod,

(b) a second frame located behind said sod cutting head and extending rearwardly therefrom,

(c) a conveyor mounted on said second frame and having its forward end positioned behind said undercutting knife to receive sod cut by said knife and to convey such sod therefrom,

(d) said first frame and said second frame being connected at a first pivotal connection located forwardly of said roller and near the ground, said first pivotal connection having its pivotal axis oriented substantially horizontally and in the direction of said path of travel,

(e) second and third connection means connected between said first and second frames rearwardly of and above said undercutting knife and spaced laterally apart, each said connection means comprising a curved track portion connected to one of said first and second frames and a roller portion connected to the other of said first and second frames, the portion of each said connection means connected to said second frame guiding the portion of such connection means connected to said first frame so that said first frame may pivot from side to side on said second frame,

(f) said curved track portions each having the contour of a section of a circle, said curved track portions together having a common center of curvature located below said curved track portions, said common center of curvature being behind said undercutting knife and substantially aligned with the axis of said first pivotal connection, said second and third connection means together having the effect of a pivot having its axis fixed with respect to said first and second frames and substantially coincident with the axis of said first pivotal connection,

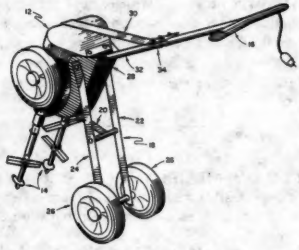
(g) and stop means connected between said first and second frames for limiting the extent of said pivoting.

4,621,697

GARDEN TILLER ATTACHMENT

Roger C. Webb, 6028 Harrison, Kansas City, Mo. 64110

Filed Mar. 11, 1985, Ser. No. 710,049
Int. Cl.[4] A01B *33/06, 33/00, 73/00*
U.S. Cl. 172—42 10 Claims



1. An auxiliary support attachment for a garden tiller wherein the tiller includes a frame supported by wheel means, a pair of forwardly extending auger-like tilling means, and a rearwardly and upwardly extending handle, said tiller being adapted to be used in a wheel-supported position with the augers extending generally forwardly and in an inverted position with the augers in a generally vertical position with the wheel means elevated off the ground, the attachment comprising a fulcrum assembly adapted to support the tiller in the inverted position, said assembly comprising:

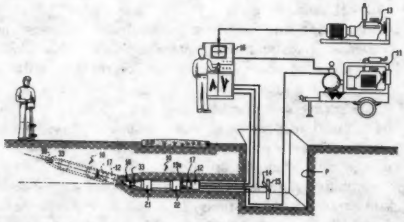
a first brace member, adapted to be attached to the tiller and extending generally upwardly and forwardly and provided with a ground-engaging means at the lower end thereof, a second brace member secured to said first brace member at one end and adapted to extend forwardly and be secured to said tiller at the opposite end, fastening means for attaching said brace members to said tiller at their respective forward ends, whereby the ground-engaging means on the lower end of said first brace member is adapted to engage the ground, such that said wheel means is out of engagement with the ground, and by vertical manipulation of said handle during operation said auger filling means may be pivotally inserted into and withdrawn from the ground.

4,621,698

PERCUSSION BORING TOOL

Gerard T. Pittard; William J. McDonald; William C. Maurer; John H. Cohen, and Gregory C. Givler, all of Houston, Tex., assignors to Gas Research Institute, Chicago, Ill.

Filed Apr. 16, 1985, Ser. No. 723,792
Int. Cl.[4] E21B *4/06, 7/08*
U.S. Cl. 175—305 16 Claims



1. A percussion tool for drilling holes in the soil comprising a cylindrical housing with a front end shaped for boring, said housing having front and rear portions of a selected

outside continuous constant diameter and an intermediate portion of lesser outside diameter providing two spaced continuous circumferential zones of frictional contact with the soil during boring,

a first means on said front end for applying a boring force to the soil,

a second means in said housing for applying a percussive force to said boring force applying means, and

said front and rear portions being operable to reduce friction with the wall of the bore formed by the tool and to permit the tool to turn in its path along a shorter radius.

4,621,699

POWER TAKEOFF FOR TRACTOR HAVING PARALLELOGRAM FRONT WHEEL SUSPENSION

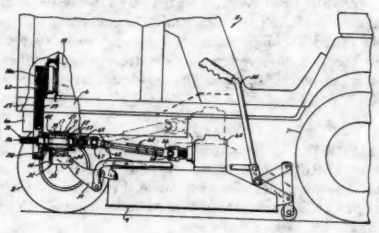
John J. Slazas, Cedarburg, Wis., assignor to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Aug. 20, 1984, Ser. No. 642,337

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.[4] B60K *25/02*

U.S. Cl. 180—53.7 **4 Claims**



1. A tractor having a rigid frame under which a mower can be carried longitudinally intermediate rear driving wheels and steerable front wheels, said tractor comprising an engine mounted on a front portion of said frame, a rigid laterally extending support member near the front end of the frame, laterally opposite wheel supporting brackets, one pivoted to each end portion of said support member to swing about a longitudinally extending upper axis, a laterally extending link pivoted to each of said brackets on a lower axis that is below and parallel to said upper axis to cooperate with the support member in connecting the brackets in a parallelogram linkage, and an axle member for each bracket having a laterally inner portion pivoted to the bracket to swing about a substantially vertical axis and having a laterally outwardly extending axle portion on which a front wheel is rotatable, said tractor being characterized by:

A. a tubular bushing secured to said support member intermediate the ends thereof with its axis extending longitudinally;

B. a power takeoff shaft coaxially rotatable in said bushing having opposite end portions that respectively project forward and rearward beyond the bushing;

C. a laterally extending hitch support having means near its opposite ends for detachable connection to it of forwardly projecting hitch members of a mower;

D. a sleeve secured to said hitch support intermediate its ends and surrounding said bushing to pivot the hitch support for tilting about the axis of the bushing;

E. a connection between said link and the hitch support whereby substantially lateral motion of the link imparts tilting motion to the hitch support; and

F. a driving connection between said engine and one of said end portions of the shaft.

4,621,700

WHEEL BEARING

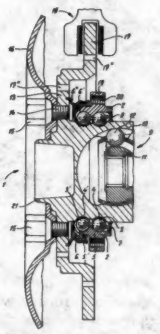
Boy Merkelbach, Utrecht, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed Oct. 24, 1984, Ser. No. 664,168

Claims priority, application Netherlands, Dec. 8, 1983, 8304240

Int. Cl.[4] B60K *17/00*; F16D *3/22*

U.S. Cl. 180—70.1 **1 Claim**



1. Wheel bearing with a built-in homokinetic coupling, including a generally annular inner part, an outer race and two rows of rolling elements located between the outside running surfaces formed on the outer race and the inside running surfaces applied to the inner part, whereby the outer race is equipped with a radially extending flange for the attachment of the bearing, and the annular inner part is equipped with a radially extending flange to which the hub of a wheel can be attached, and whereby this inner part forms at the same time one unit with the outer ring of the homokinetic coupling characterized by the fact that the flange (13, 13') of the inner part (1, 1') is extended with a brake element (17, 17') which forms the part to be braked of a braking mechanism (18, 18'), so that the inner part (1, 1') of the bearing, the carrier flange (113, 13') for the wheel, the brake element (17, 17') and the outer ring (10, 10') of the homokinetic coupling (9, 9') form one homogeneous unit, the inner raceway surfaces for the rolling elements being treated to form a high grade bearing material and said inner part having an axial stub (21, 21') directed away from the homokinetic coupling (9, 9') and extending beyond the attachment flange (13, 13') to define a guide means for the hub (16, 16') of the wheel.

4,621,701

ELECTRIC POWER STEERING APPARATUS

Toshiyuki Takabayashi, Toyota; Tomio Yasuda, Kasukabe, and Katsuhiro Sano, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 19, 1985, Ser. No. 713,542

Claims priority, application Japan, Mar. 23, 1984, 59-56514

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—79.1 **14 Claims**

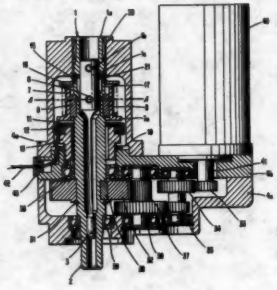
1. An electric power steering apparatus comprising:

a housing;

input and output shafts rotatably supported by said housing;

a torque sensor for sensing torque applied to said input shaft, said sensor including angular displacement means disposed between said input and output shafts for angularly displacing said input and output shafts a distance relative to one another in accordance with said applied torque, a member mounted in said housing to be movable axially of said input and output shafts, said movable member having a radially extending surface, an electrode plate secured to

said housing, said plate having a radially extending electrode surface spaced from, parallel to, and opposing said radial surface of said movable member, and axial displacement means including said movable member and one of said input and output shafts, said axial displacement means responsive to said angular displacing of said input and output shafts for varying the axial position of said movable



member in order to vary the electrostatic capacity of said electrode plate in accordance with the axial distance between said opposing spaced surfaces;

circuit means connected to said electrode plate to generate an output having a value in accordance with said electrostatic capacity; and

an electric motor means for impairing a torque to said output shaft in accordance with the output of said circuit means.

4,621,702

FOUR-WHEEL STEERING APPARATUS OF A VEHICLE

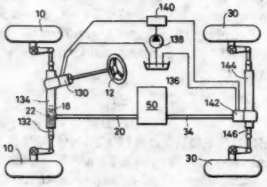
Hirotaka Kanazawa; Teruhiko Takatani; Shigeki Furutani, all of Hiroshima; Isamu Chikuma, Maebashi; Satoru Shimada, Maebashi, and Hiroshi Eda, Maebashi, all of Japan (99), assignors to Mazda Motor Corp., Hiroshima and Nippon Seiko K.K., Tokyo, both of, Japan

Filed Sep. 5, 1984, Ser. No. 647,431

Claims priority, application Japan, Sep. 8, 1983, 58-164133; Sep. 8, 1983, 58-164134; Sep. 8, 1983, 58-164135

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—140 **5 Claims**



1. A four-wheel steering apparatus of a vehicle having:

a front wheel steering device for steering the front wheels of the vehicle;

a rear wheel steering device for steering the rear wheels of the vehicle, said rear wheel steering device including a mechanism having a power cylinder for hydraulically effecting the steering of the rear wheels;

means for taking out a control force for said rear wheel steering device from said front wheel steering device;

same direction steering control force transmitting means for transmitting said taken-out control force as a same direction steering control force for steering the rear wheels in the same direction as the front wheels;

reverse direction steering control force transmitting means for transmitting said taken-out control force as a reverse direction steering control force reversed in direction and increased in magnitude for steering the rear wheels in the direction reverse to the front wheels;

said same direction and reverse direction steering control forces being transmitted as the control force of valve means for controlling said power cylinder and steering the rear wheels;

reverse direction steering control force insensitive zone setting means for absorbing said transmitted control force and disabling the transmission of the reverse direction steering control force when the absolute value of the steering angle of the front wheels is less than a predetermined value and enabling the transmission of the reverse direction steering control force when said absolute value is greater than said predetermined value; and

reversible direction transmitting means for transmitting the same direction steering control force to said rear wheel steering device when it receives only such control force and absorbing the same direction steering control force by the reverse direction steering control force opposite in direction and great in magnitude and enabling only the reverse direction steering control force to be transmitted to said rear wheel steering device when it receives both of the same direction and the reverse direction steering control force;

whereby the front wheels and the rear wheels are steered in the same direction when said absolute value is less than said predetermined value, and the rear wheels are steered in the direction reverse to the front wheels when said absolute value is greater than said predetermined value.

4,621,703

HYDRAULIC AUXILIARY POWER STEERING, ESPECIALLY FOR MOTOR VEHICLES

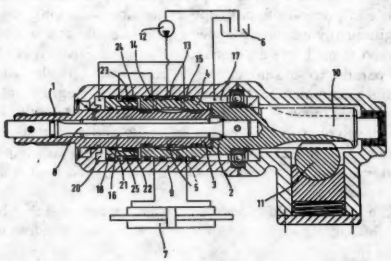
Werner Breitweg, Schwäbisch Gmünd, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP84/00360, § 371 Date Jul. 24, 1985, § 102(e) Date Jul. 24, 1985, PCT Pub. No. WO85/02380, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 14, 1984, Ser. No. 760,737

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—143 **9 Claims**



1. In a power steering control device of the kind having a housing (9) with a steering spindle having a first section (1) and a second section (2), said sections being relatively rotative and connected by a torque rod (8) wherein the first section is for connection to a manually operated steering wheel to receive steering force and the second section is for mechanical connection to vehicle wheels, said sections having a coacting inner (3) and outer (4) valve sleeves for operation of a servomotor (7) having pressure chambers connecting to respective passages (14, 15) of said outer sleeve to be pressurized responsive to relative rotation of said steering spindle sections, including a steering reaction means responsive to operating pressure in said pressure chambers for simulating steering resistance;

the improvement wherein:

the steering reaction means comprises a reaction piston (18) carried coaxially on said first spindle section (1) and reaction chambers (20, 21) in said housing with the faces of said reaction piston exposed in respective reaction chambers;

means whereby either reaction chamber receives pressure during operation of said servomotor so as to shift said reaction piston;

helical gearing (22) intermediate said reaction piston and said first section of said steering spindle;

a sliding keyway (25) intermediate said reaction piston and said second section (2) of said steering spindle to prevent relative rotation therebetween;

whereby pressure acting on either face of said reaction piston is operative to shift said piston and thereby effect a rotative torque force on said first section of said steering spindle through said helical gearing to oppose steering force on said first section, simulating steering resistance.

4,621,704
POWER STEERING SYSTEM

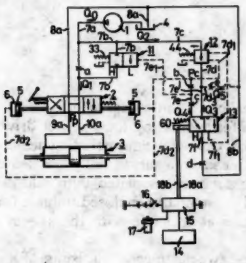
Hajime Kozuka, Okazaki, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,673

Claims priority, application Japan, May 19, 1983, 58-86598; May 19, 1983, 58-86600; May 19, 1983, 58-73787[U]; May 19, 1983, 58-73789[U]; May 19, 1983, 58-73790[U]; May 19, 1983, 58-73791[U]; May 19, 1983, 58-73792[U]; Jun. 10, 1983, 58-87967[U]

Int. Cl.⁴ B62D 5/06

U.S. Cl. 180—143 **19 Claims**



1. A power steering system comprising: an input shaft coupled to a steering wheel; a torsion bar for transmitting rotation of said input shaft to an output shaft; an oil path switching valve engaged with said output shaft so as to rotate integrally with said output shaft and in which oil paths are switched according to a rotational angle difference between said input shaft and said output shaft; a power cylinder coupled to said output shaft; a high pressure oil path for supplying working oil delivered from an oil pump to said power cylinder via said oil path switching valve; a low pressure oil path for returning the working oil from said power cylinder to an oil tank via said oil path switching valve; a reaction piston means operatively engaged with said input shaft for applying a restraint force which restrains the rotational angle difference between the input shaft and the output shaft; a control oil path branched from said high pressure oil path and communicating with said reaction piston means; a pressure control valve means interposed in said control oil path for controlling the oil pressure to be equal to or lower than a predetermined highest pressure; a flow rate control valve connected on the downstream side of said pressure control valve for controlling a flow rate from said pressure control valve in response to a car speed, a first orifice communicating the downstream side of said flow rate control valve with said low pressure oil path, and a pilot oil pressure path connected between the upstream side of said first orifice and said pressure control valve for transmitting a pilot pressure generated upstream of said first orifice to said pressure control valve for controlling the delivery pressure from the oil pump to said power cylinder so that the steering torque is linearly proportional to the oil pump delivery pressure and for controlling the oil pressure to said reaction piston for causing the reaction force of said reaction piston means to be in proportion to the speed of the car.

4,621,705
SYSTEM FOR AUTOMATICALLY CONTROLLING VEHICLE SPEED

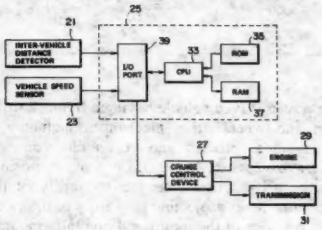
Yoshiyuki Etoh, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Oct. 9, 1984, Ser. No. 658,529

Claims priority, application Japan, Dec. 6, 1983, 58-229041

Int. Cl.⁴ B60T 7/16

U.S. Cl. 180—169 **3 Claims**



1. A system for automatically controlling the speed of a vehicle, comprising:

(a) means for detecting vehicle speed and outputting a first signal indicative thereof;

(b) means for calculating a safe inter-vehicle distance between the controlled vehicle and another vehicle preceding same on the basis of the vehicle speed detected by said vehicle speed detecting means;

(c) means for detecting the actual inter-vehicle distance between the vehicle and the preceding vehicle and outputting a second signal indicative thereof;

(d) means responsive to the second signal for calculating the rate of change of the inter-vehicle distance per predetermined unit of time;

(e) means for correcting the calculated safe inter-vehicle distance according to the rate of change of inter-vehicle distance calculated by said inter-vehicle change rate calculating means; and

(f) means for controlling the vehicle speed according to the difference between the corrected safe inter-vehicle distance and the detected actual inter-vehicle distance, said vehicle speed controlling means selecting a rate of change of increase of the vehicle speed from a plurality of predetermined values when the difference between the corrected safe inter-vehicle distance and the actual vehicle distance increases and selecting a rate of change of decrease of the vehicle speed from among a plurality of predetermined values when the difference between the corrected safe inter-vehicle distance and the actual inter-vehicle distance decreases, the selected rate of increase or decrease in vehicle speed being detected by determining in which of a plurality of predetermined ranges the difference between the actual and corrected safe inter-vehicle distance lies, said vehicle speed controlling means controlling the vehicle speed together with an overdrive solenoid valve of an automatic transmission of the vehicle released when determining that an absolute value of the difference between the actual and corrected safe inter-vehicle distance is within or greater than a maximum one of said predetermined ranges.

4,621,706

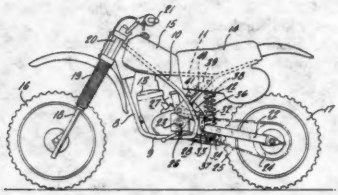
MOTORCYCLE DRIVE WHEEL SUSPENSION SYSTEM

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

Continuation-in-part of Ser. No. 577,026, Feb. 6, 1984, Pat. No. 4,558,761, which is a continuation-in-part of Ser. No. 544,091, Oct. 21, 1983, Pat. No. 4,544,044, which is a continuation-in-part of Ser. No. 513,311, Jul. 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 368,220, Apr. 14, 1982, Pat. No. 4,408,674. This application Dec. 13, 1985, Ser. No. 808,643

Int. Cl.[4] B60K *25/04*

U.S. Cl. 180—227 5 Claims



1. In a power driven vehicle having a frame, a drive wheel, a motor, and wheel drive mechanism including a motor sprocket, a wheel sprocket, and a drive chain connecting the sprockets, a drive wheel suspension system comprising a swing arm for the drive wheel extended forwardly of the wheel sprocket, a first lever projecting forwardly of the swing arm in a plane at one side of the motor and pivotally mounted on an axis substantially coincident with the driving sprocket, a second lever positioned in a plane at the other side of the motor and pivotally mounted on a axis spaced below the driving sprocket and extended rearwardly of the driving sprocket, linkage pivotally interconnecting the first and said second levers in a generally upright transverse plane between the motor and wheel sprockets, the swing arm being pivotally connected with said linkage, said second lever having a portion extended rearwardly beyond said linkage to a position below the swing arm, a swing arm link extended between the swing arm and said second lever extension and pivotally interconnecting the swing arm and said second lever extension, and means connected with the wheel suspension system for resisting drive wheel deflection.

4,621,707

CONTROL SYSTEM FOR A FOUR WHEEL DRIVE VEHICLE

Yuichi Fukuhara, Toyota; Hiroyuki Mizutani, Chiryu, and Takeshi Fuchigami, Hekinan, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 20, 1985, Ser. No. 703,560

Claims priority, application Japan, Mar. 28, 1984, 59-045463[U]

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—247 6 Claims

1. A control system for a four wheel drive vehicle, comprising:

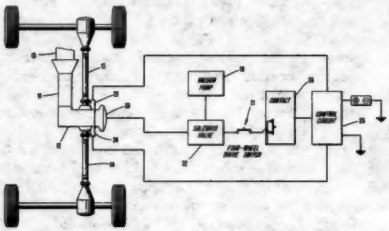
a first sensor for detecting a rotational frequency of a front propeller shaft;

a second sensor for detecting a rotational frequency of a rear propeller shaft;

a control circuit for determining the rotational frequency difference between said front propeller shaft and said rear propeller shaft and for generating control signals relative to a predetermined set point;

a contact actuated by said control circuit;

the vehicle including an automatic shift type four wheel drive; and



the control circuit preventing engagement of the four wheel drive when the frequency difference is greater than the predetermined set point.

4,621,708

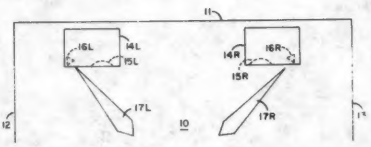
TWEETER BIDIRECTIONAL RADIATING

Dewey Potter, Holliston, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Aug. 20, 1984, Ser. No. 642,531

Int. Cl.[4] H05K *5/00*

U.S. Cl. 181—144 19 Claims



1. A loundspeaker system comprising,

cabinet means for supporting loudspeaker drivers,

said loudspeaker cabinet means including means for supporting woofer means in a substantially enclosure volume,

tweeter support means associated with said cabinet means outside said substantially enclosed volume for supporting tweeter means at an angle with the axis of said woofer means,

and at least one tweeter means consisting of a single driver for radiating sound energy outside said cabinet means to both the rear and front supported by said tweeter support means,

said tweeter support means comprising tweeter baffle means for allowing cancellation of sound pressure front-to-rear around said baffel means below a predetermined frequency in the middle range of audio frequencies to establish a desired low frequency response of the supported tweeter means.

4,621,709

SOUND ATTENUATING PARTITIONS AND ACOUSTICAL DOORS

Edwin N. Naslund, Santa Rosa, Calif., assignor to Cal-Wood Door, Santa Rosa, Calif.

Filed Jul. 10, 1985, Ser. No. 753,703

Int. Cl.[4] E04B *1/82*

U.S. Cl. 181—284 7 Claims

1. An acoustical door, comprising:

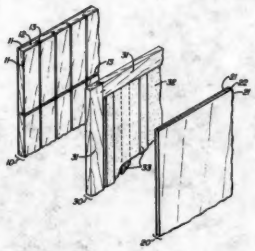
first and second outside rigid panels held spaced apart by connections at their edges, thereby to form between inner surfaces thereof an enclosed void therein;

said first and second panels having substantially different thicknesses from each other; and

at least one of the inner surfaces having multiple recesses

made therein, thereby to form an absorptive acoustical trap;

a sheet of material substantially more dense and flexible than said first and second panels, and held in between said first and second panels by said connections at their edges;



said sheet having a thickness substantially less than that of said enclosed void, thereby to form an absorptive acoustical barrier.

4,621,710

BEARING LUBRICATION SYSTEM FOR EXTENSION HOUSING OF VEHICULAR TRANSMISSION

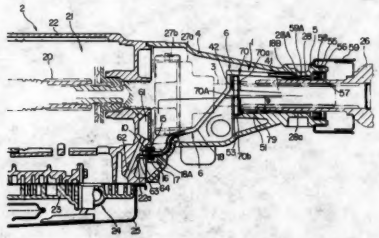
Kazumasa Tsukamoto; Takuji Taniguchi, both of Anjo; Seitoku Kubo, and Yutaka Taga, both of Toyota, all of Japan, assignors to Aisin-Warner Limited, Anjo and Toyota Motor Corporation, Toyota, both of, Japan

Filed Dec. 19, 1984, Ser. No. 683,616

Claims priority, application Japan, Dec. 27, 1983, 58-247443; Dec. 27, 1983, 58-247444; Dec. 27, 1983, 58-247445

Int. Cl.[4] F01M *11/06*

U.S. Cl. 184—6.27 **6 Claims**



1. A bearing lubrication system for bearing means supported with an extension housing of an automatic transmission, said extension housing connected at one end face flush to an end face of a transmission case, said transmission having a hydraulic control system incuding a valve casing fastened to said transmission case and a transmission output shaft supported in said extension housing, and said extension housing having a sleeve yoke splined to said output shaft and fitted within the bearing means supported by said extension housing, wherein said hydraulic control system includes a first passage formed in said transmission case for supply of hydraulic operating fluid under pressure from said valve means, and wherein said lubrication system is provided with a forced feed lubrication means comprising:

second passage means, branched off from said first passage, for supplying hydraulic operating fluid to said bearing means thereby lubricating said bearing means, second passage means including a first passage portion running through said transmission case and terminating at said end face of said transmission case and a second passage portion running between a first terminus at said one end face and a second terminus discharging said fluid for lubrication of said bearing means;

sealing means for connecting said first and second passage portions at the juncture of said end faces;

throttle means, disposed within said second passage means, for limiting the flow of fluid therethrough; and

fluid collecting means for establishing a pool of said fluid in contact with said bearing beneath said output shaft, said fluid collecting means comprising a weir and a trough formed in said extension housing and running between said weir and said bearing means.

4,621,711

PRESSURE OIL LINE SYSTEM FOR A FORK LIFT TRUCK

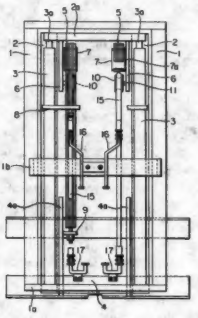
Toshun Miyashige, Takahama; Masataka Sakata, Handa, and Masakazu Asano, Ohbu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 6, 1984, Ser. No. 679,007

Claims priority, application Japan, Dec. 16, 1983, 58-194635[U]

Int. Cl.[4] B66B *9/20*

U.S. Cl. 187—9 E **3 Claims**



1. In a fork lift truck having a mast assembly made up of inner and outer masts, a lower cross beam mounted between the outer masts, an upper tie beam mounted between the inner masts, at least one lifting cylinder mounted on the lower cross beam and having a piston rod attached to the upper tie beam, chain means for raising and lowering a lifting bracket and a hydraulically driven unit carried by the lifting bracket, the improvement comprising a pressure oil line system comprising:

hose means for supplying oil under pressure to the hydraulically driven unit;

at least one wheel bracket connected to the upper tie beam;

hose pulley means, mounted on said at least one wheel bracket, for rotatably supporting said hose means;

chain wheel means, mounted on said at least one wheel bracket at a position between the upper tie beam and said hose pulley means, for rotatably supporting the chain means;

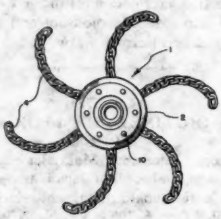
said chain wheel means including at least one chain wheel pulley having a first diameter and said hose pulley means including at least one hose wheel pulley having a second diameter which is smaller than said first diameter, said at least one chain wheel pulley being vertically aligned with said at least one hose wheel pulley and the chain means being vertically aligned with and on either side of at least a portion of said hose means, whereby said hose means and said hose pulley means are hidden by the chain means which improves the forward view of a driver of the fork lift.

4,621,712

ANTI-SKID DEVICE FOR MOTOR VEHICLES

Ragnar Härdmark, Linköping, Sweden, assignor to Onspot AB, Linköping, Sweden

Filed Jan. 9, 1985, Ser. No. 690,003
Claims priority, application Sweden, Jan. 17, 1984, 8400204
Int. Cl.[4] B60T *1/04*
U.S. Cl. 188—4 B 14 Claims



1. In an anti-skid device of the type which comprises a disk having a plurality of chains attached at one end thereto adapted to be thrown sequentially into the space between the rotating tire of the vehicle and the supporting surface as the disk is driven by contact with the side wall of the tire so that each chain comes between the tire and the surface to diminish skidding of the tire on the surface, the improvement which comprises a disk having the periphery which contacts the side wall of a tire of sufficiently narrow width to split a layer of water on the side wall and provide essentially dry, non-slipping contact of the periphery of the disk with the side wall of the tire instead of hydroplaning on it, said periphery being semicircular and connected by a diverging section having sloping upper and lower surfaces connecting it to the central portion of the disk to which the chains are attached at one end.

9. A disk for an anti-skid device having a plurality of chains secured at one end thereto, the periphery of which will contact the side wall of a tire in use, and periphery having a sufficiently narrow width to spread a layer of water on the side wall and provide essentially dry, non-slipping contact of the periphery of the disk with the side wall of the tire instead of hydroplaning on it, said periphery in cross-section being semi-circular and connected by a diverging section having sloping walls above and below the semi-circle connecting it to the central portion of the disk to which the chains are attached at one end.

4,621,713

ACTUATING MECHANISM FOR A DISC BRAKE

Jean J. Carré, Le Raincy; Pierre Pressaco, La Courneuve, and Jean P. Sauvee, Aubervilliers, all of France, assignors to Societe Anonyme D.B.A., Paris, France

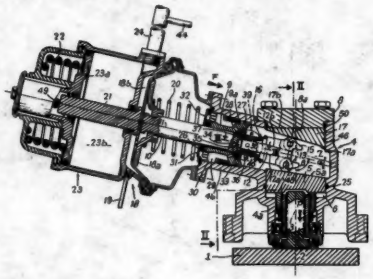
Filed Feb. 15, 1985, Ser. No. 701,897
Claims priority, application France, Feb. 29, 1984, 84 03106
Int. Cl.[4] F16D *65/32*
U.S. Cl. 188—72.7 9 Claims

1. An actuating mechanism for a disc brake, incorporating:

a piston coupled to a brake pad,

a wedge having a pair of slightly convergent inclined surfaces moveable longitudinally, under the effect of a control component, along a transverse direction relative to a direction of movement of the piston and between facing surfaces forming part of the piston and of a reaction component, respectively, each of the facing surfaces being essentially parallel to a respective inclined surface of the wedge, and

at least one pair of rollers with each roller situated on a side of the wedge and able to roll between the inclined surfaces of the wedge and the facing surfaces of the piston and reaction component, characterized in that space situated between the facing surfaces of the piston and reaction component in which the wedge and rollers are able to move, is defined as a closed chamber filled with hydraulic fluid, and that the control component is a control rod which, entering into the closed chamber by a variable amount according to longitudinal movements of the rod from a rest position, determines in the chamber variations in volume which produce a hydraulic thrust on the piston



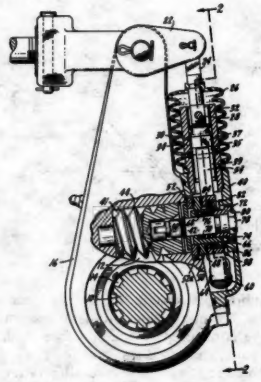
with resulting movement of the piston being slightly greater than movement which the wedge would communicate mechanically to the piston by means of the rollers for a similar movement of the control rod and in the absence of hydraulic fluid enclosed in the closed chamber.

4,621,714

VEHICLE SLACK ADJUSTER CLUTCH

James A. Skurka, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Jul. 12, 1985, Ser. No. 754,462
Int. Cl.[4] F16D *65/60*
U.S. Cl. 188—196 BA 13 Claims



1. In a slack adjuster for vehicle brakes adapted to be mounted between a brake chamber and a brake operating shaft, a body, a drive member movable relative to and positioned by said body on the brake operating shaft, a lever arm pivoted to said body, an adjustable connection between said lever arm and drive member for the sensing and take-up of slack during a brake application, said adjustable connection including a clutch having facing and relatively rotatable clutch surfaces, each of which has opposing cooperating ratchet teeth, the teeth on one of said surfaces being separated into a plurality of radially spaced circumferential bands, the teeth on said opposing surface being radially coextensive with the radially spaced circumferential bands of teeth on said one clutch surface, the

teeth in each band being positioned to independently engage teeth on the opposing clutch face to provide increments of slack adjustment equal to the combined number of teeth in said bands.

4,621,715

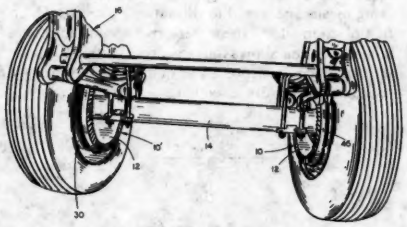
BRAKE DRUM DRYING FINS

Lynn Denton, 3205 10th Ave., Council Bluffs, Iowa 51501

Filed Mar. 8, 1985, Ser. No. 710,227

Int. Cl.[4] F16D *65/827*

U.S. Cl. 188—264 R **12 Claims**



1. An apparatus for drying and cooling a brake drum including a generally cylindrical peripheral wall extended interiorly from a generally upright annular exterior wall and terminating in a circular interior edge, said apparatus comprising:

an elongated flexible strip adapted to be wrapped around the peripheral wall of a brake drum adjacent the interior edge thereof,

a plurality of fins connected to said strip and extended upwardly therefrom at generally right angles thereto,

said fins being twisted so that the upper edges thereof are disposed generally parallel to one another and at an acute angle relative to the longitudinal centerline of said strip whereby, upon wrapping said strip around the peripheral wall of a brake drum with said fins extending inwardly from the interior edge thereof, air flow is directed along the inner surface of said peripheral wall interiorly away from said interior edge in response to said rotation of the brake drum in one direction, and

means for removably securing said strip on the peripheral wall of a brake drum.

4,621,716

BAGGAGE SET

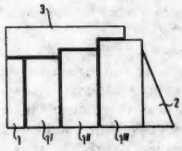
Klaus Rienäcker, Prinzregentenstrasse/Max Josefs-Platz 1, D-8200 Rosenheim, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,290

Claims priority, application Fed. Rep. of Germany, May 7, 1984, 8413837[U]

Int. Cl.[4] A45C *5/00, 13/00;* B65D *21/02*

U.S. Cl. 190—108 **8 Claims**



1. A baggage set comprising, in combination, a plurality of substantially parallelepipedic case elements of different sizes which, when said cases are placed side-by-side with a wall of each in planar alignment, present, at another side, a stepped profile, at least one prismatic sloping case element, and at least one stepped case element having a side with a plurality of steps, wherein the steps of the stepped case element are dimensionally coordinated to the the stepped profile of the parallelepipedic cases so as to fit thereagainst in a stacked arrangement, and wherein a side of the sloping case is dimensioned for fitting against a side of the stacked arrangement in a predetermined manner causing the baggage set, as a whole, to fill a volume dimensioned to substantially match that of a storage compartment of a particular vehicle.

4,621,717

WHEEL HUB CLUTCH ASSEMBLY

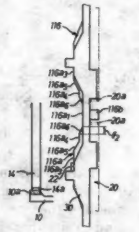
Takayoshi Onodera, Toyota, and Toru Kagata, Kariya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Aug. 24, 1984, Ser. No. 643,734

Claims priority, application Japan, Aug. 26, 1983, 58-156635

Int. Cl.[4] F16D *11/10*

U.S. Cl. 192—36 **3 Claims**



1. A wheel hub clutch assembly, comprising:

a cylindrical body provided therein with internal splining and to be attached to a wheel hub for rotation therewith;

an inner sleeve contained within said cylindrical body to be fixedly mounted on a driveable axle for rotation therewith;

a clutch member provided thereon with external splining and splined to said inner sleeve to be maintained in a first position in which the external splining of said clutch member is disengaged from the internal splining of said body to uncouple said wheel hub from said axle and to be axially moved from the first position to a second position in which the external splining of said clutch member is engaged with the internal splining of said body to drivingly couple said wheel hub to said axle;

a cam ring formed at one side thereof with a cam face and rotatably mounted on said inner sleeve;

a cam follower arranged between said clutch member and said cam ring and splined to said inner sleeve to cooperate with the cam face of said cam ring to be axially moved toward and away from said clutch member in response to rotation of said inner sleeve;

a return spring for loading said cam follower toward the cam face of said cam ring;

means for connecting said cam follower with said clutch member; and

means for applying a braking force to said cam ring in response to rotation of said cam follower;

wherein the cam face of said cam ring includes:

a valley portion for receiving thereon said cam follower to maintain said clutch member in the first position,

a first slope portion extending circumferentially and axially outwardly from said valley portion to effect axial movement of said cam follower toward said clutch member by engagement with said cam follower,

an intermediate flat portion extending circumferentially from said first slope portion for receiving thereon said cam follower to effect and maintain engagement of the

external splining of said clutch member with the internal splining of said body,

a second slope portion extending circumferentially and axially outwardly from said intermediate flat portion to effect further axial movement of said cam follower toward said clutch member by engagement with said cam follower, and

a flat ridge portion extending circumferentially from said second slope portion for receiving thereon said cam follower to complete engagement of the external splining of said clutch member with the internal splining of said body.

4,621,718

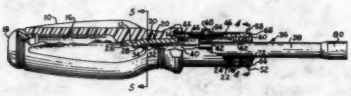
RATCHET SCREWDRIVER

Joseph P. DeCarolis, Bristol, Conn., assignor to Stanley Works, New Britain, Conn.

Filed Nov. 29, 1982, Ser. No. 445,263

Int. Cl.[4] F16D *41/08*; B25B *15/00, 15/04*

U.S. Cl. 192—43 **14 Claims**



1. A ratchet mechanism housing assembly for hand tools and the like comprising a drive shaft having an enlarged diameter ratchet wheel fixedly mounted thereon, an elongated housing having an axially extending cavity that is closed at one end and at end opposite the closed end is provided with an enlarged mouth of a size suitable for ready insertion of the shaft and ratchet wheel therethrough, a bearing positioned within said axial cavity at said closed end, said shaft being positioned within said cavity in engagement with said bearing and said ratchet wheel being positioned fully within said cavity, said shaft extending through said enlarged mouth and outwardly thereof, a shaft aligning bushing coaxially mounted on said shaft and cooperating with said housing to enclose said cavity at said enlarged mouth, said bushing and housing including mating opposed slots, a segment stop member extending through one of said slots into the opposite slot for preventing relative axial movement between said bushing and said housing, interlocking means between said bushing and said housing for preventing relative rotational movement therebetween, and enclosure means for retaining said segment stop between said bushing and said housing.

4,621,719

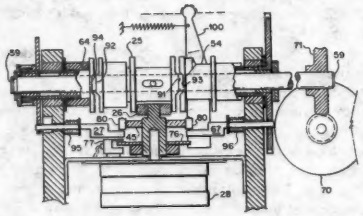
DRIVE BASE FOR A POSTAL MAILING SYSTEM

Lloyd G. Kittredge, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 31, 1985, Ser. No. 697,087

Int. Cl.[4] F16D *21/00*

U.S. Cl. 192—48.1 **8 Claims**



1. In a postal mailing system including a postage metering device and a mailing machine, a drive base system for engaging the metering device and the printing system of a mailing machine having a printing system, the drive base system comprising:

a shaft means which is in selectable rotatable engagement with the metering device and the mailing machine,

a rotatable meter drive section which is selectably engaged at one end of the shaft means,

a rotatable tape drive section which is selectably engaged at the opposite end of the shaft means,

means connected to the shaft means for engaging the meter drive section or the tape drive section to the shaft means,

means for actuating the engaging means, and

locking means connected to the actuating means which in a first position allows the meter drive section to rotate, in a second position allows the tape drive section to rotate and in a third position prevents rotation of the meter drive section and tape drive section.

4,621,720

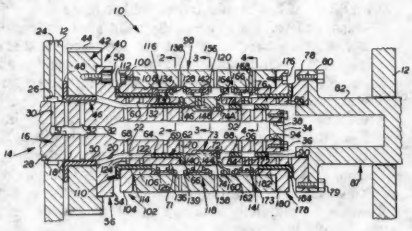
DUAL START DRIVE SYSTEM

Thaddeus F. Zlotek, Center Line, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 26, 1985, Ser. No. 813,538

Int. Cl.[4] F16D *41/04*

U.S. Cl. 192—48.92 **11 Claims**



1. A dual start drive system for starting a rotating device comprising,

a. a first input over-running clutch having an inner and an outer race,

b. a second input over-running clutch having an inner and an outer race,

c. an output over-running clutch having an inner and an outer race,

d. a first drive member for driving said inner race of said first clutch,

e. a second drive member for driving said inner race of said second clutch,

f. a driven member for being driven by said inner race of said output clutch with said driven member being available for imparting starting rotational forces,

g. separate one way drive means between said inner races and outer races of said first and second clutches for allowing said inner races to drive said outer races and for allowing said outer races to over-run said inner races,

h. and one way drive means between said inner and outer races of said output clutch for allowing said outer output clutch race to drive said inner output clutch race and for allowing said inner output clutch race to over-run said outer output clutch race,

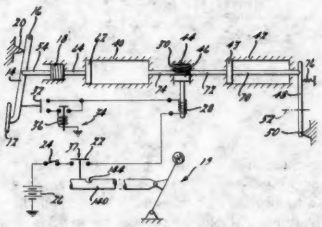
i. said outer races of said first, second and output clutches being connected for unitary rotation.

4,621,721

SYSTEM FOR NEUTRAL POSITION SHIFT LEVER CLUTCH DISENGAGEMENT

Henry E. Czerwick, Dearborn; Richard A. Petts, Detroit, and Raymond R. Russell, Garden City, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 13, 1984, Ser. No. 670,716
Int. Cl.[4] B60K *41/28*
U.S. Cl. 192—0.052 13 Claims



1. A system for controlling the operation of a clutch that connects and disconnects a power source and a transmission having a gear selector moveable into and away from a neutral position as a clutch actuator is moved comprising:

a manually operated actuator moveable between a clutch applied position and a clutch released position;

a master cylinder containing a piston connected to the manual actuator;

a slave cylinder hydraulically connected to the master cylinder containing a piston connected to the clutch actuator;

valve means for opening and closing communication between the master cylinder and slave cylinder; and

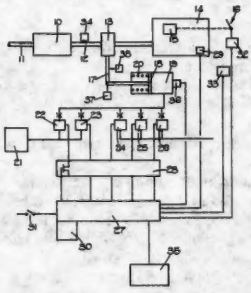
means for closing the valve when the transmission gear selector is in the neutral position and for opening the valve when the gear selector is not in the neutral position.

4,621,722

CONTROL SYSTEM FOR VEHICLE TRANSMISSION

Robert P. Page; John N. Cheel; Stuart I. Howarth, and John P. Millward, all of Birmingham, England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Dec. 11, 1984, Ser. No. 680,556
Claims priority, application United Kingdom, Jan. 24, 1984, 8401822
Int. Cl.[4] F16D *47/06*
U.S. Cl. 192—0.055 13 Claims



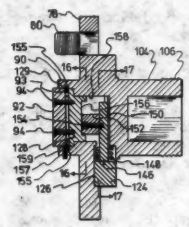
1. A control system for a vehicle clutch having an input member coupled to the output shaft of the vehicle engine and an output member coupled to the input shaft of a multi-ratio gearbox and a powered actuator including a clutch actuating cylinder, said control system comprising first valve means for admitting fluid to said actuating cylinder to effect the process of engagement of the clutch in at least two distinct operational phases, first means for sensing a demand for vehicle movement and acting to operate said first valve means to admit fluid to said cylinder to achieve a target force tending to cause engagement of the clutch, means for sensing the attainment of said target force and hence a predetermined clutch engagement and the end of a first operation phase of clutch engagement, the process of engagement of the clutch then continuing in a further phase in which said valve means is operated so that the clutch is further engaged in a controlled manner and processing means for determining said target force when the vehicle is at rest by measuring the values of force required to cause a predetermined acceleration or speed of the input shaft of the gearbox and subtracting an offset value from said value to provide said target force.

4,621,723

FREEWHEELING ADAPTER

Gaynor V. Carlson, Atwood, Kans., assignor to Bell and Carlson, Incorporated, Atwood, Kans.

Filed Nov. 20, 1984, Ser. No. 673,391
Int. Cl.[4] F16D *1/06, 11/00*; B60B *27/02*
U.S. Cl. 192—71 6 Claims



1. A lockable freewheeling adapter for use on a vehicle having tires, rims and vehicle studs and designed to be mounted on an existing wheel hub of the vehicle to convert the wheel to freewheeling or non-freewheeling as desired thereby permitting the vehicle to be quickly converted to freewheeling so that it can be towed, comprising:

(a) a fixed member having a plurality of holes and wheel nuts positioned within the member and in juxtaposition to the holes for mounting the fixed member to the existing wheel hub using the existing vehicle studs, the fixed member being formed with a central opening for receipt of an axle;

(b) at least one female locking member fixedly attached to the fixed member;

(c) a rotatable member, rotatably mounted on the fixed member and having formed thereon a plurality of mounting studs for mounting the tire and rim of the vehicle on the mounting studs, the rotatable member comprising a circular plate having said axle fixedly attached thereto;

(d) a plurality of nuts, positioned on the rotatable member studs for tightly holding the tire and rim of the vehicle to the rotatable member;

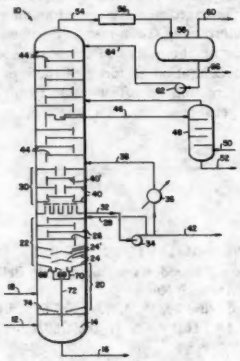
(e) at least one male locking member, moveably mounted in the rotatable member for engagement with the female locking member attached to the fixed member; and

(f) means, associated with the rotatable member and male locking member, for moving the male locking member from a locked position to an unlocked position thereby converting the adapter from a non-freewheeling condition to a freewheeling condition.

4,621,724
FRACTIONATOR HAVING REDUCED PRODUCT VAPOR CONDENSATION IN THE FLASH ZONE

Rino L. Godino, Livingston, N.J., and Robert R. DeBiase, Staten Island, N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Sep. 13, 1984, Ser. No. 650,157
Int. Cl.[4] B01D *3/06*
U.S. Cl. 196—139 3 Claims



1. Apparatus for producing petroleum products in a coking process comprising:

a fractionator having a bottom;

a pool of petroleum residue and recycle liquid in the bottom of said fractionator;

a flash zone defined in said fractionator above said pool;

means for conveying petroleum residue to said pool in the fractionator bottom;

means for conveying from a coke drum product vapors into said flash zone, wherein condensation of the product vapor tends to occur, the product vapors being relatively warm with respect to said pool; and

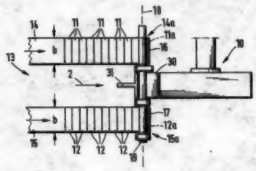
means for reducing the condensation of the product vapors in said flash zone, said condensation reducing means including barrier means for isolating the relatively warm product vapors in said flash zone from said pool, wherein the barrier means comprises a baffle positioned between the flash zone and the pool, said baffle being a downwardly pointing imperforate frustoconical element arranged across the entire cross-section of said fractionator except for a central opening therein.

4,621,725
APPARATUS FOR FEEDING ARTICLES TO A PACKAGING STATION

Karl J. Rütter, Pulheim, Fed. Rep. of Germany, assignor to ROSE Verpackungsmaschinenfabrik theegarten GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Apr. 12, 1985, Ser. No. 722,608
Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416499
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—448 3 Claims

1. Apparatus for feeding articles, especially those with a sensitive surface, such as chocolates or sweets, to a packaging station, such as a wrapping device or the like, with two longitudinal conveyors arranged next to one another and with a transfer device which guides the articles supplied alternately by the two conveyors into the packaging station one after the other, characterized in that at the ends (**14***a* and **15***a*) of the longitudinal conveyors (**14** and **15**) facing the packaging station (**10**) there is a cross-slide (**19**) which extends transversely over the two conveyors (**14, 15**) and is movable to and fro and which has at its ends (**19***a*, **19***b*) pivotable engagement means (**25, 26**) which alternately engage behind the articles (**11***a*, **12***a*) lying in the same vertical plane (**18**) on the two longitudinal conveyors (**14, 15**) and located nearest to the packaging station (**10**) and present them to a pushing-in device (**31**) arranged between the longitudinal conveyors (**14, 15**) and pushing the articles (**11***a*, **12***a*) presented to it into the packaging station

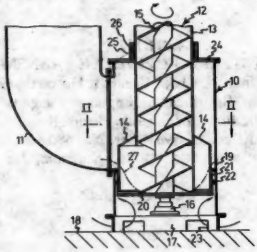


(**10**), said engagement means (**25, 26**) being connected firmly in various angular positions to the cross-slide (**19**) which is rotatable about its longitudinal axis and which is controlled in such a way that during each stroke it executes an angular rotation, as a result of which one engagement means (**25** or **26**) is povited into the crossliding path of the articles (**11***a*, **12***a*) and the other engagement means (**26** or **25**) is pivoted out of it.

4,621,726
SEALING DEVICE FOR RELATIVELY ROTATING SURFACES IN A CONVEYOR

Arne V. Johansson, Höganäs, Sweden, assignor to AB Siwertell, Bjuv, Sweden

Filed Mar. 5, 1984, Ser. No. 586,208
Claims priority, application Sweden, Mar. 10, 1983, 8301296
Int. Cl.[4] B65G *33/00*
U.S. Cl. 198—671 4 Claims



1. A screw conveyor for transferring bulk goods from a lower level to an upper level, comprising

a rotary screw shaft having an upper end and a lower end, and with a helical screw thereon, and means to rotate said shaft;

a bearing means for rotatably supporting said rotary shaft at said lower end;

a first cylindrical element having a cylindrical sidewall and a bottom wall, said first cylindrical element being fixedly mounted to said rotary shaft for rotation therewith;

a second cylindrical element surrounding said helical screw and mounted independently of said helical screw so that said helical screw rotates relative to said second cylindrical element; and

shielding means for said bearing means, said shielding means comprising a third cylindrical element surrounding said first cylindrical element and closely spaced thereto with an annular gap therebetween, and sealing means mounted between said first and third cylindrical surfaces and oriented so that rotation of said first cylindrical element

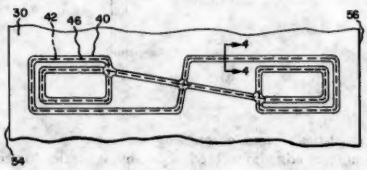
effects a sweeping movement by said sealing means which causes movement of material attempting to enter the annular gap between said first and third cylindrical surfaces to be pushed upwardly in a direction back out of said annular gap.

4,621,727

CONVEYOR BELT DAMAGE SENSOR

Don S. Strader, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 13, 1985, Ser. No. 765,300
Int. Cl.[4] B65G *43/00*
U.S. Cl. 198—810 **16 Claims**



1. A reinforced conveyor belt having included therein a conductor for use in a rip monitoring system, said belt comprising:

(a) an elastomeric body having an upper carrying surface and a parallel lower pulley engaging surface, each surface extending indefinitely in a direction of travel of the belt;

(b) a plurality of reinforcement layers positioned within said elastomeric body;

(c) a plurality of envelopes of low coefficient of friction material positioned within said elastomeric body and spaced apart in the direction of travel of the belt, wherein each envelope establishes a void area in said elastomeric body within said envelope; and

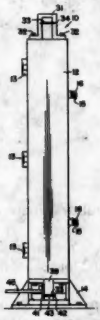
(d) a shaped conductor positioned within said envelope such that said conductor is free to move within said void area during operation of said reinforced conveyor belt.

4,621,728

SUSPENSION IDLER METHOD AND APPARATUS

Arthur F. Kain, 1726 Virginia Ct., Lakeland, Fla. 33803

Continuation-in-part of Ser. No. 283,726, Jul. 15, 1981, Pat. No. 4,354,656, which is a continuation of Ser. No. 174,750, Aug. 4, 1980, Pat. No. 4,301,109. This application Jan. 21, 1982, Ser. No. 341,488
Int. Cl.[4] B65G *39/10*
U.S. Cl. 198—827 **7 Claims**



1. A suspension idler comprising in combination:

an elongated flexible molded polymer idler member having a plurality of intermediate rollers formed thereon connected by a plurality of spaced flexible shaft portions;

a plurality of said plurality of spaced flexible shaft portions having a length between the rollers to the cross-section diameter ratio of greater than 1.5, and a plurality of said plurality of spaced flexible shaft portions having surfaces of increased smoothness resulting from mold portions polished to a mirror-like finish;

said idler member having an end roller on each end thereof and having a rigid shaft molded in each end roller and protruding therefrom;

each said intermediate roller being shaped with a sloped surface between the perimeter of the roller and said connecting molded shaft portion; and

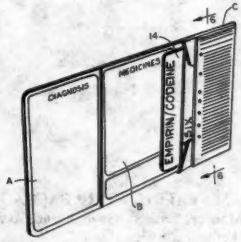
each said rigid shaft having means for attaching a bearing thereto.

4,621,729

PATIENT MEDICAL INFORMATION AND EDUCATION CONTAINER

Frank W. Jackson, Mechanicsburg, Pa., assignor to J N Associates, Camp Hill, Pa.

Filed Jan. 14, 1985, Ser. No. 691,333
Int. Cl.[4] B65D *27/08, 27/06*
U.S. Cl. 206—37 **2 Claims**



1. A patient medical information and education container, comprising

an elongated blank including a first pair of spaced parallel fold lines defining first, second, and third panels of similar configurations, each of said panels having factual material designations printed on opposite sides thereof defining area on which factual and medical data relating to a patient is to be placed, said third panel including a pair of side flaps connected therewith and defined by a second pair of spaced parallel fold lines arranged normal to said first pair of fold lines and an end flap connected therewith and defined by a third fold line parallel with said first pair of fold lines, said third panel side flaps being foldable toward each other about said second pair of fold lines, respectively, to positions generally parallel and adjacent said third panel, and said third panel end flap being folded about said third fold line to a position in contiguous relation with said side flaps to define a pocket between said third panel and said side and end flaps; and

at least one printed planar card arranged within said pocket, said card having medicinal information for the patient printed on one side thereof and caution information relating to the medicinal information printed on the other side thereof,

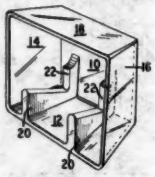
said panels being successively foldable about said first fold lines into contiguous relation to define a compact container having the general dimensions of one of said panels, whereby said container may easily be carried by a patient in a pocket, wallet, purse, or the like.

4,621,730

AERATED SOAPHOLDER

Joseph J. Mancusi, Jr., 25 Port Tack, Hilton Head Island, S.C. 29928

Filed Apr. 2, 1985, Ser. No. 719,170
Int. Cl.[4] A47K *5/08*
U.S. Cl. 206—77.1 5 Claims



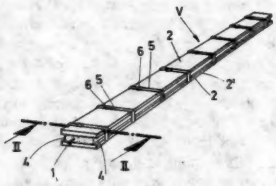
1. A soapholder comprised of a floor having horizontal ridges extending from front to back and upon which a soap bar may rest, a rear wall having a set of vertical ridges against which the soap bar may rest and side walls which diverge forwardly from the rear wall and against which a rectangular soap bar would only make point contact when also resting against the vertical ridges on the rear wall, so that air flow may occur about all sides of the soap bar.

4,621,731

FOAM SEALING STRIP PACKAGE

Rolf Tschudin-Mahrer, Lausen, Switzerland, assignor to Irbit Holding AG, Fribourg, Switzerland

Filed Oct. 10, 1984, Ser. No. 659,583
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1983, 8330528[U]
Int. Cl.[4] B65D *71/00*
U.S. Cl. 206—83.5 5 Claims



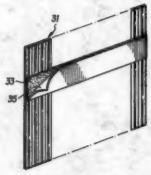
1. A package of foam sealing strip, comprising
foam sealing strip of delayed rebound,
two unbendable panels sandwiching the sealing strip therebetween, said panels protrude on both side of the sealing strip,
a plurality of removable hoops arranged spaced apart from each other hold the panels which in turn hold the sealing strip therebetween in compressed state, and
non-adherable layers respectively are disposed between broad sides respectively of the sealing strip and corresponding inner surfaces of the panels, whereby upon release of said removable hoops the foam sealing strip does not exhibit noticeable rebound for at least 12 hours.

4,621,732

FASTENING APPARATUS FOR TWIST TIES

Robert H. Olson, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 512,504, Jul. 11, 1983. This application Jun. 13, 1985, Ser. No. 744,347
The portion of the term of this patent subsequent to Mar. 31, 1998, has been disclaimed.
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206—346 4 Claims



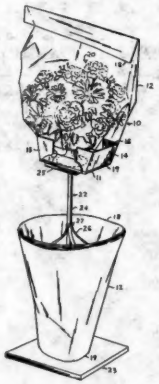
1. A twist-ties system, comprising:
a plurality of edge-connected, separable twist ties forming a gang of twist ties;
adhesive means applied to a portion of one surface of said gang of twist ties; and
a removable protective material applied to an exposed surface of said adhesive means, whereby said protective material can be removed to expose said surface of said adhesive means to permit fastening of said gang of twist ties to a surface by means of said adhesive means.

4,621,733

PACKAGE FOR HORTICULTURAL ITEMS

Charles C. Harris, 2386 Jackson Ct., Arnold, Mo. 63010

Continuation of Ser. No. 358,333, Mar. 15, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,679
Int. Cl.[4] B65D *85/50*
U.S. Cl. 206—423 7 Claims



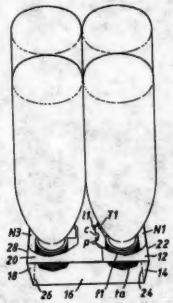
1. A package for horticultural items with a receptacle comprising:
(a) an erectable container means including:
1. a polygonal shaped base portion for supporting the receptacle, and
2. a plurality of side portions connected to and extending upwardly from the base portion about the receptacle the side portions including a first pair of opposed side portions extending upwardly and outwardly from the base portion, and

(b) a tapered flexible sleeve having a relatively larger upper opening and a relatively smaller lower opening, the sleeve engageable with the container side portions to support the container means.

4,621,734
TOP-GRIPPING CARRIER WITH INTERLOCKED PANELS

Johan Heijnen, Bergen Op Zoom, and Martinus Bakx, Roosendaal, both of Netherlands, assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 27, 1986, Ser. No. 822,708
Claims priority, application United Kingdom, Jan. 25, 1985, 8502015; Jul. 24, 1985, 8518725
Int. Cl.[4] B65D *75/00, 85/62, 71/00*
U.S. Cl. 206—427 **8 Claims**



1. An article carrier of the top-gripping type which connects together and supports a plurality of bottles by their flanged neck portions, the carrier being formed from a single elongated blank of foldable sheet material having a series of panels joined along transverse fold lines, said blank including terminal panels at opposing ends thereof and which, when assembled, provides a top and a base interconnected by spaced side wall panels and together form a tubular structure, said top and base each having a plurality of article receiving apertures with the apertures in the top disposed in registry with the apertures in the base, at least one retention tab being provided on at least one of said terminal panels, said retention tab being positioned adjacent one of said apertures in the base and being engaged therein, characterized in that said retention tab is folded inwardly through said one aperture to extend within said tubular structure so as to maintain said carrier in erected condition when a bottle has been inserted through the aperture in the base and the flange or cap thereof positioned in said aperture in the top whereby said retention tab is maintained in folded condition by said bottle.

4,621,735
COVER FOR SURGICAL LIGHT HANDLE AND TOUCH PANEL

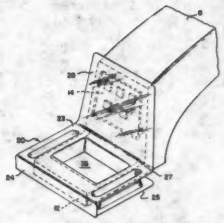
Dennis C. Coon; Michael A. Narusewicz, and Ward L. Sanders, all of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Feb. 27, 1985, Ser. No. 705,972
Int. Cl.[4] B65D *81/28*
U.S. Cl. 206—438 **5 Claims**

1. An assembly for enabling a nonsterile person to attach a sterile barrier to a handle and a control panel of nonsterile adjustable equipment located in a sterile field, said assembly comprising:

a sterile cover for isolating a handle and a control panel from a sterile field, said cover having a fold section dividing said cover into first and second halves, said cover being bendable along said fold section for permitting said cover to assume a closed position in which said halves conform generally to the shape of a handle, said cover having means carried by said first and second halves for holding said cover in said closed position, said cover further having a flap attached to one of said halves; and

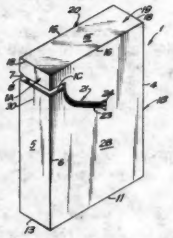
a container configured for housing said cover in a partially closed position while maintaining said flap in compression, said container being constructed of a deformable material which is impervious to microorganisms thereby maintaining said cover sterile and permitting, upon opening said container, said cover to be manipulated while still in said container from said partially closed position to said closed position about a handle, and upon withdrawal of said cover from said container said flap springs into a position which isolates a control panel from a sterile field.



4,621,736
RECLOSEABLE CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Waldorf Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 602,757, Apr. 23, 1984, abandoned. This application Jun. 10, 1985, Ser. No. 743,023
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—606 **11 Claims**



1. A generally rectangular recloseable carton formed from a single blank of paperboard material, said carton comprising:

rectangular side walls disposed in spaced parallel relationship;

a pair of rectangular end walls foldably connected to and extending between the side walls of said carton;

opposed rectangular top and bottom walls extending between and foldably connected to the respective side and end walls; and

a tear strip extending continuously around said carton generally parallel to the top and bottom walls thereof, said tear strip comprising a pair of spaced apart parallel partial cut lines extending into the outer surface of said carton a distance equal to between approximately 20 percent and 50 percent of the thickness of the paperboard material from which the carton is formed, said tear strip further comprising a tear string adhered to the inner surface of the carton at a location thereon generally centrally between the partial cut lines, said tear string having a thickness

substantially less than the distance between the partial cut lines, whereby a pulling force exerted on said tear strip causes a tapered severance in the paperboard material from which the carton is formed.

4,621,737

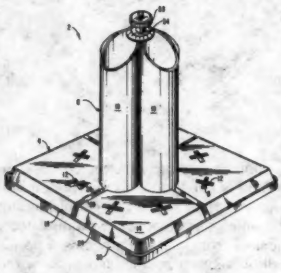
SKI RACK

Thomas P. Casey, P.O. Box 3636, Ketchum, Id. 83340

Filed Mar. 15, 1984, Ser. No. 590,007

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—70.5 3 Claims



1. A ski rack for holding a plurality of skis and ski poles in a vertical position, comprising:

(a) a base;

(b) means in said base for holding said ski poles in a vertical position;

(c) a plurality of elongated tubular members for supporting the skis, said tubular members being disassemblably connected to and extending perpendicular from a recessed section in said base, said tubular members being also substantially contiguous to each other and contained in the center of said base;

(d) securing means which secures said tubular members to said base; and

(e) means in said base for catching water including an outer channel along the perimeter of said base and four inner channels connecting said recessed section to said outer channel.

4,621,738

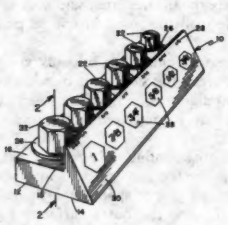
HOLDER FOR WRENCH SOCKETS

Christopher J. DeLucchi, 122 Nardo Ave., Solana Beach, Calif. 92075

Continuation of Ser. No. 169,946, Jul. 18, 1980, abandoned. This application Jun. 7, 1983, Ser. No. 501,877

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—70.6 10 Claims



1. A holder for wrench sockets comprising:

a wrench socket support member capable of transport to and use at a job site,

a plurality of hexagonal nut shaped wrench socket mounting studs of at least two different specific nut sizes projecting outward from the support member for selectively mounting wrench sockets of the type having a nut engaging recess and a handle engaging recess, each stud being specifically sized to snugly engage a nut engaging recess of only one specifically sized socket, each stud having a different specific size, the holder supporting said sockets in a mandatory selected order of specific nut sizes and with the handle engaging recess of the sockets extending outward for engagement with and connecting to a handle while supported on said studs.

4,621,739

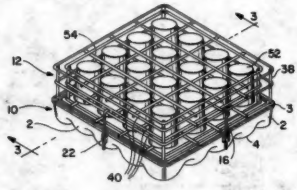
TRAY FOR GLASS RACKS

Mark S. Heymann, 3721 39th St., NW., Washington, D.C. 20016, and Richard Gagliardi, 479 62nd St., Newport Beach, Calif. 92663

Filed Dec. 12, 1983, Ser. No. 560,505

Int. Cl.[4] A47B *73/00*

U.S. Cl. 211—74 11 Claims



1. A debris holding tray removably attached beneath a glass or dish rack having a perforated base and suitable for use in a dishwasher, said tray comprising:

a bottom member with upstanding side walls defining a top edge of said bottom member, said bottom member and said side walls retaining liquid or solid debris falling through said perforated base; and

a plurality of attaching means for releasably securing said tray beneath said rack and enabling selective detachment of said rack from said tray for insertion of said rack into said dishwasher and for disposal of said debris from said tray, said attaching means being fixed to one of said tray and said rack and releasably secured to the other of said tray and said rack, a peripheral edge of said perforated base of said rack being located on the top edge of said bottom member.

4,621,740

MULTI-STORY TOWER FOR GOODS DISPLAY

Franz J. Lang, Kelkheim, Fed. Rep. of Germany, assignor to Display-Design GmbH für moderne Verkaufsförderungsmittel und Raumausstattung

Filed Feb. 6, 1985, Ser. No. 698,630

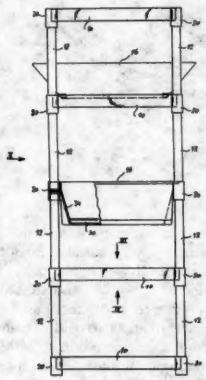
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, 8403538[U]

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—133 12 Claims

1. A multi-story tower for goods display, comprising a plurality of carrier elements (10,18) vertically spaced from one another, and a plurality of vertically extending spacer support columns (12) connecting two successive carrier elements (10,18) with one another, said carrier elements (10,18) having a bottom (21,28) and a substantially rectangular circumference when regarded in vertical direction with two mutually opposite first circumferential edges (23) and two mutually opposite second circumferential edges (25), said carrier elements (10,18) further being provided with at least two stiffening ribs (24;30,34) on the respective bottom (21,28), said stiffening ribs (24;30,34) extending parallel with respect to said first edges

(23) and being inwardly spaced from respective first edges (23) by equal distances, said stiffening ribs (24;30,34) extending towards said second edges (25), four tubular reception sockets (20) each with a substantially vertical axis and a circular external circumference being provided at said second edges (25), such that respective axes of said sockets (20) are in horizontal alignment with respective longitudinal axes of said stiffening ribs (24;30,34), said sockets (20) being interconnected with said stiffening ribs (24;30,34) at respective ends thereof in substantially vertical planes extending along said stiffening ribs (24;30,34) and containing the axes of respective tubular sockets (20), each said tubular socket (20) being further connected with



the respective second edge (25) by two outwardly concave interconnection bows (27), said interconnection bows (27) adjoining substantially tangentially the external circumference of said sockets (20) on the one hand and the respective second edge (25) on the other hand, the interconnection bows (27) of each socket (20) being substantially symmetrical with respect to the respective stiffening rib (24;30,34) when regarded in vertical direction, said tubular sockets (20) receiving respective ends of respective lower and upper spacer support columns (12), said spacer support columns (12) permitting an observation of the respective bottom (21,28) in a direction parallel to said first edges (23) on both diametrically opposed sides of the respective spacer support columns (12).

4,621,741

READILY DISASSEMBLEABLE PORTABLE ROOF HOIST MOUNTED ON THE ROOF OF A BUILDING FOR LIFTING HEAVY PRODUCTS TO THE ROOF FROM BELOW

Charles W. Boon, 515 33rd St., Fort Madison, Iowa 52627

Filed Dec. 23, 1985, Ser. No. 812,382
Int. Cl.[4] B66C *23/26*
U.S. Cl. 212—175 **7 Claims**

1. In an improved portable, readily disassemblable, roof hoist mounted on the roof of a building for lifting heavy products, such as heavy rolls of roofing, from the ground, or from below, to the roof, the combination of:

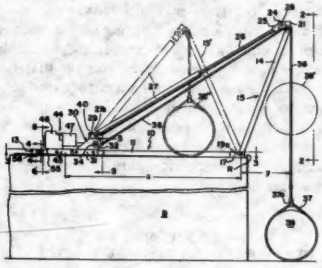
a. a first, base, A-frame, disposed transversely to the edge of the roof with the ends of its legs adjacent an edge of the roof, and lying with its apex rearward thereof, on the roof, free of an securement to the roof; a plane through the ends of the legs lying generally parallel to the edge of the roof;

b. a second generally vertically disposed A-frame having its leg ends releasably pivotally connected to the leg ends of the first A-frame for fore and aft vertical swinging movement of its apex from a position above a location spaced substantially inboard of the edge of the roof to a position substantially outboard of the edge of the roof;

c. an elongate forwardly extending hydraulic cylinder having a cylinder rod pivotally releasably connected to the apex of the second A-frame, and its opposite end pivotally releasably connected at the said apex of the first A-frame;

d. a sheave supported for rotation at the apex of the second frame;

e. a winch drum mounted at the apex of the first frame and having a cable wound around the drum with a free end



extending around the sheave and having a load carrier mounted on the forward end thereof;

f. a hydraulic motor connected to drive said winch drum; and

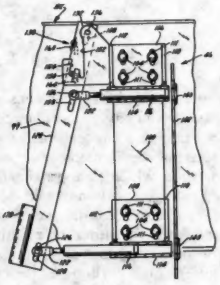
g. a hydraulic pump and internal combustion engine assembly detachably connected to weight down said first A-frame and hydraulically coupled with said cylinder and motor to drive them selectively.

4,621,742

BOOM EXTENSION STORAGE MEANS AND MECHANISMS

Ram N. Rathi, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Jan. 25, 1985, Ser. No. 694,944
Int. Cl.[4] B66C *23/70*
U.S. Cl. 212—177 **7 Claims**



1. In a crane:

a main boom;

a boom extension;

means for pivotally connecting said boom extension to said main boom so that said boom extension can be swung between an inuse position in axial alignment with said main boom and a stored position alongside said main boom;

and storage means for releasably securing said boom extension in said stored position,

said stroage means including:

pin means mounted on one of said main boom and said boom extension;

pin-engaging means mounted on the other of said main boom and said boom extension;

a lever mounted on one of said main boom and said boom extension and pivotally movable between a pin-disengaged position and a pin-engaged position and operable to effect corresponding relative movement between said pin means and said pin-engaging means, said lever being shiftably movable as well as pivotally movable;

and latch means for releasably securing said lever in either of its positions, said latch means comprising releasably inter-engageable means on said lever and on that boom on which said lever is mounted which engage or disengage in response to shifting movement of said lever, said latch means further including biasing means connected between said lever and that boom on which said lever is mounted for biasing said lever so that said releasable inter-engageable means are engaged.

4,621,743

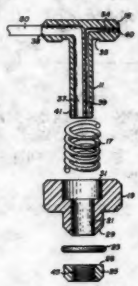
SELF-SEALING CLOSURE DEVICE

Joseph A. DiRegolo, San Leandro, and Hugo Hauser, Palo Alto, both of Calif., assignors to Tritec Industries, Inc., Mountain View, Calif.

Filed May 16, 1985, Ser. No. 735,480

Int. Cl.[4] B65D *39/00*

U.S. Cl. 215—308 **13 Claims**



1. A self-sealing closure device for use with liquid chemical bottles comprising:

a. a stem member dimensioned for slidable insertion through the mouth of a bottle and having an enlarged top portion;

b. a collar member having a channel formed therethrough for slidably receiving the stem member and having an enlarged top portion which is approximately the same diameter as said enlarged portion of said stem member;

c. retainer means secured to the distal end of the stem member and dimensioned to fit within the mouth of a bottle;

d. resilient biasing means disposed about the stem member between said enlarged top portion and the collar member to urge the collar member toward the retainer means;

e. deformable seal means mounted to surround the stem member between the collar member and the retainer means such that, with the retainer means fully inserted within the mouth of a bottle, releasing the biasing means will urge the retainer means toward the collar member and deform the seal means in a radially outward direction to form a fluid-tight seal with the mouth of the bottle;

f. channel means formed through the stem member from the end of the stem member to the side of said enlarged portion of said stem member for receiving a tube at each end for withdrawing liquid chemicals from the bottle; and

wherein the device can be operated by using one hand to securely grasp and squeeze said stem member and collar member together without bending or crushing said tubes.

4,621,744

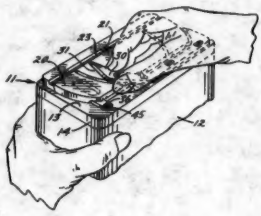
TAMPER-EVIDENT CONTAINER CLOSURE

John A. Foster, Rockford, Ill., assignor to J. L. Clark Manufacturing Co., Rockford, Ill.

Filed Jan. 6, 1986, Ser. No. 816,323

Int. Cl.[4] B65D *17/34*

U.S. Cl. 220—270 **11 Claims**



1. A container closure comprising a top panel piece molded of plastic, a dispensing opening formed through said panel piece, a flap molded integrally with said panel piece along a hinge line and swingable upwardly and downwardly about said hinge line and relative to said panel piece between open and closed positions with respect to said dispensing opening, said flap having a front edge extending generally parallel to said hinge line, an elongated plastic strip piece extending alongside and spaced forwardly from the front edge of said flap and overlying said panel piece when said flap is in said closed position, tearable webs molded integrally with and spaced along said strip piece and the front edge of said flap and extending between the two, upright openings formed through one of said pieces, upright plastic pins molded integrally with the other of said pieces and extending into said openings, and means on said pins for normally holding said strip piece and said flap downwardly against said panel piece but sufficiently weak to tear in response to an upwardly lifting force being applied to one end portion of said strip piece whereby said strip piece may be lifted upwardly from said panel piece and torn away from the front edge of said flap at said webs thereby to enable the flap to be swung upwardly to its open position.

4,621,745

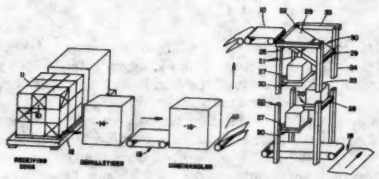
MECHANIZED CARTON PICKER

Robert W. Grace, P.O. Box 666, Sandusky, Ohio 44870

Filed Oct. 24, 1984, Ser. No. 664,337

Int. Cl.[4] B65G *13/00*

U.S. Cl. 221—75 **14 Claims**



1. A vertically accumulating storage and dispensing apparatus for containers and the like comprising:

a frame defining a first tower section and a second tower section;

a column of vertically spaced shelf trays supported by each tower section, each cloumn being adapted to support a stack of containers to be stored and dispensed, the shelf

trays of each column facing inwardly from the respective tower section toward the shelf trays of the other column and being staggered vertically relative thereto, all of said shelf trays being mounted to their respective tower section for pivotal movement between an upwarly tilted receiving position, an intermediate storage position and a downwardly tilted transfer position, whereby said containers are supported individually spaced apart from and free of contact with one another by said shelf trays in their respective storage positions;

means urging each shelf tray to said receiving position when unloaded;

means for latching eaching shelf tray in said receiving position and for releasing said shelf tray from said receiving position upon receiving a container being transferred thereto;

releasable stop means each shelf tray, each stop means being mounted to the frame and being engageable with the respective shelf tray for retaining the shelf tray in its storage position when supporting a container; and

link means operatively connected between the stop means for each shelf tray and the next lower shelf tray of the opposite tower section for releasing said shelf tray from said storage position when the next lower shelf tray of the opposite tower section is empty and tilted upward by said urging means to said receiving position, whereupon the container on the released shelf tray slides directly from said released shelf tray onto the next lower shelf tray.

4,621,746

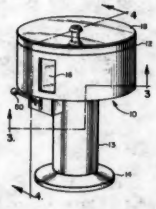
VENDING APPARATUS

Gregory C. Reichle, 1020 Troost Ave., and Bruce H. Leeseberg, 1015 Troost Ave., both of, Forest Park, Ill. 60130

Filed Sep. 13, 1984, Ser. No. 650,354

Int. Cl.[4] G07F *11/54*

U.S. Cl. 221—76 **13 Claims**



1. An apparatus for vending articles comprising:

a horizontally disposed housing including an open top and a sliding door on its vertical face;

a removable carousel rotatably mounted in said housing, said carousel provided with a plurality of openended radial compartments for holding articles;

a removable enclosure for covering the top of said housing;

means for rotating said carousel in increments corresponding to the angular displacement of one compartment; and

means for opening and closing said sliding door including

a coin-activated lever;

a pulley wheel rotatably mounted on the inner vertical face of said housing;

means connected to the sliding door and lever via said pulley wheel for opening said sliding door when said lever is depressed; and

means for closing said sliding door when said lever is not depressed.

4,621,747

APPARATUS FOR CHARGE-WISE DOSING A METERED VOLUME QUANTITY OF A FLOWING MEDIUM CONTINUOUSLY SUPPLIED TO THE APPARATUS UNDER DELIVERY PRESSURE

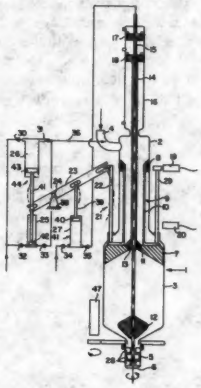
Ype Y. van der Velde, Wommels, and Athanasius A. Bootsma, Sneek, both of Netherlands, assignors to Tebel Machinefabrieken B.V., Netherlands

Filed Jun. 28, 1984, Ser. No. 625,513

Claims priority, application Netherlands, Jul. 1, 1983, 8302358

Int. Cl.[4] B67D *5/56*

U.S. Cl. 222—137 **7 Claims**



1. An apparatus for charge-wise dosing a metered volume of a flowing medium to be supplied continuously under a delivery pressure comprising: a pair of serially connected cylinders and pistons of different diameters, said cylinders comprising cylinder blocks axially arranged relatively to each other and connected together to form a composite housing; a supply conduit for the flowing medium connected to the smaller diameter cylinder block; a fill-up nozzle having a discharge opening and connected to the larger diameter cylinder block; a tube assembly including said smaller diameter piston, said tube assembly being mounted for reciprocation in the composite housing, said tube assembly being in direct communication with the smaller diameter cylinder block and being connected to the larger diameter cylinder block via a passage provided in the larger diameter piston, and said tube assembly carrying at least the larger diameter piston; a first valve mounted proximate the passage in the larger diameter piston for closing and opening of the passage; a second valve mounted proximate the access to the fill-up nozzle for closing and opening the access to the fill-up nozzle, valve operating means coupled for operation of the valves; and control means coupled to said valve operating means.

4,621,748

THERMOPLASTIC BLOCK SHAPE, FEEDING MECHANISM AND MANUFACTURING METHOD

Michael M. Dziki, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

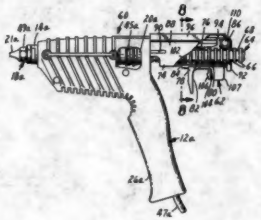
Continuation of Ser. No. 456,346, Jan. 7, 1983, Pat. No. 4,552,287. This application Oct. 23, 1984, Ser. No. 664,044

Int. Cl.[4] B67D *5/62*

U.S. Cl. 222—146.5 **13 Claims**

1. In combination, a block of solid thermoplastic material comprising coaxial generally cylindrical portions of uniform predetermined axial and diametrical dimensions uniformly axially spaced along the block by rectangular portions having diagonal dimensions about equal to said diametrical dimension;

and a device for dispensing molten thermoplastic material from said block comprising a frame including a handle positioned so that an operator can grip the handle with the fingers of one hand, a barrel member mounted on said frame and having an internal melting chamber communicating with an outlet opening through a nozzle, a sleeve with a through opening having one end secured to said barrel member with said through opening communicating with the end of said melting chamber opposite said outlet opening, said sleeve being adapted to receive said block of solid thermoplastic material with one end portion of the block in the melting chamber and the block projecting through said sleeve, means for heating said barrel member to melt the end portion of the block therein, and a feeding mechanism at the end of said sleeve opposite said melting chamber comprising wall means fixed to said frame and defining a passageway adapted to guide the solid thermoplastic material block in alignment with the through opening in said sleeve, a slide having an upper surface positioned adjacent one side of the block, and being mounted on said frame for movement along a path generally aligned with the melting



chamber from a retracted position spaced from said sleeve to an advanced position more closely adjacent the sleeve and back to said retracted position, drive means carried by said slide adapted for engaging said cylindrical portions and advancing the block of thermoplastic material toward the melting chamber during movement of said slide from its retracted to its advanced position, and for moving around the cylindrical portions and along the block of thermoplastic during movement of said slide from its advanced to its retracted position, means for aligning the block of thermoplastic in said passageway for engagement by said drive means, and means projecting from the side of said slide opposite said upper surface in a direction generally at a right angle to said upper surface including a first projecting part adjacent said sleeve and a second projecting part spaced from the side of said first projecting part opposite said sleeve for defining a recess between said first and second parts adapted to receive the end portion of the thumb of an operator gripping said handle to afford manual movement of said slide body toward said advanced position and toward said retracted position.

4,621,749

DISPENSING APPARATUS

Joseph S. Kanfer, Akron, Ohio, assignor to Go-Jo Industries, Cuyahoga Falls, Ohio

Filed Feb. 21, 1984, Ser. No. 581,693

Int. Cl.[4] B67D 5/42

U.S. Cl. 222—153 **17 Claims**

1. A dispenser for dispensing viscous material from a container having an elongate, flexible dispensing tube, comprising:

(A) a body;

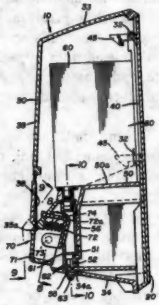
(B) a cover attached to said body and movable between open and closed positions;

(C) means, carried by said body, for supporting the container and locating the dispensing tube in dispensing condition;

(D) said body having a mounting portion for attachment to a vertical surface;

(E) pressure means carried by said body and urged into engagement with the tube by movement of the cover to said closed position and being further movable into collapsing and dispensing engagement with the tube;

(F) said pressure means being movable toward said mounting portion of said body to collapse the tube and dispense the material;



(G) locking means carried by said body for movement into and out of locking engagement with said cover; and

(H) said locking means being releasably attached to said body.

4,621,750

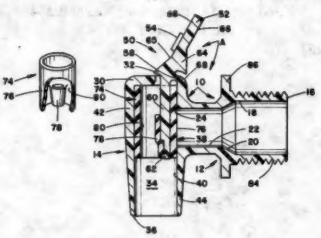
DISPENSER VALVE

Henry G. Roethel, Bedford Heights, Ohio, assignor to The Meyer Company, Cleveland, Ohio

Filed Apr. 12, 1985, Ser. No. 722,402

Int. Cl.[4] B67D 3/00

U.S. Cl. 222—505 **26 Claims**



1. A dispensing valve comprising:

a body member including a first portion having a first passageway open at both ends and a second portion having a second passageway open at a first end and generally closed at a second end, said first passageway communicating with said second passageway at a port disposed along the side wall of said second passageway intermediate said first and second ends;

a handle operably associated with said body and extending at least partially into said second passageway from said generally closed second end, said handle being selectively moveable between valve open and closed conditions; and,

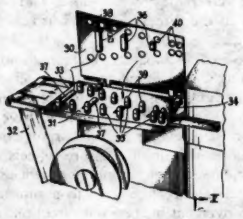
a tube-like seal member received in said second passageway in a covering relationship with at least said port, and means for operatively connecting said handle to said seal member for causing said seal member to be shearingly shiftable between blocking and non-blocking relationships relative to said port in response to movement of said handle between said closed and open conditions, respectively, for controlling fluid flow between said first and said second passageways.

4,621,751

MULTIPLE, LONGITUDINAL FOLDING APPARATUS

Angel Lorenzo Barroso, Arquitecto Cabanes, s.n., Mataro (Barcelona), Spain

Division of Ser. No. 487,766, Apr. 22, 1983, Pat. No. 4,533,164. This application Aug. 1, 1985, Ser. No. 761,492
Claims priority, application Spain, Apr. 23, 1982, 512263; Apr. 23, 1982, 265171
Int. Cl.[4] A41H *43/00*
U.S. Cl. 223—28 5 Claims



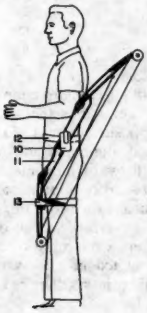
1. An apparatus for making multiple, longitudinal folds in a web of flexible material comprising a pair of flat plates extending substantially parallel but spaced from each other, pairs of edge engaging means extending between said plates for engaging the edges of a web fed between said plates, each plate having a plurality of folding elements with elements of one plate being staggered along a path in relation to said elements of said other plate.

4,621,752

NONRIGID BOW HOLSTER

Steven R. Youngbauer, 707 W. 8th St., Gillette, Wyo. 82716

Filed Jul. 11, 1985, Ser. No. 753,918
Int. Cl.[4] A45F *55/00*
U.S. Cl. 224—253 2 Claims



1. A holster for carrying a compound bow in a nonrigid horizontal position at the archer's waist comprising of:

(a) a means for attachment to the archer's belt characterized by a belt loop constructed of flexible material such as leather or plastic with one piece folded and attached to itself;

(b) an oblong pocket attached to the belt loop for placement of the bowhandle constructed by attaching a second piece of flexible material to one end of the belt loop to form a "V" shaped shell and a third piece of flexible material with one end attached to the "V" shaped shell and the middle of the same piece attached to the outside of the belt loop;

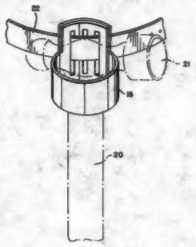
(c) a safety strap to secure the bowhandle in the oblong pocket constructed by attaching a connecting means characterized by velcro or a snap to the unattached end of the third piece of flexible material and the front of the holster whereby the belt loop is attached to the archer's belt and the bowhandle is placed in the oblong pocket and secured by the safety strap.

4,621,753

BELT SUPPORTED TOOL CARRIER

Jody W. Ridings, Shelby, N.C., assignor to Plastic Oddities, Inc., Shelby, N.C.

Filed Feb. 11, 1985, Ser. No. 700,719
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—253 3 Claims



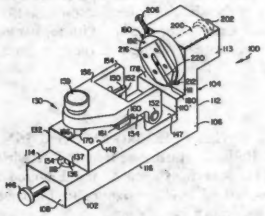
1. A tool carrier for support on the belt of a person for holding a tool shaft therein, consisting of a single strap formed into a substantially open bottomed cylindrical body and of a length permitting the ends thereof to overlap when forming said cylindrical body of a predetermined size for receiving the shaft of a tool, wherein at least two slits extending through each of the strap ends, including at least one overlapping end portion, are disposed for receiving a belt threaded therethrough to position the tool carrier on the belt with the cylindrical body axis vertical.

4,621,754

TOOL AND METHOD FOR CLEAVING OPTICAL FIBERS

Eric L. Long, Northbrook, and Anton Brey, Chicago, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Filed Jan. 3, 1983, Ser. No. 455,383
Int. Cl.[4] C03B *37/16*
U.S. Cl. 225—96 10 Claims



1. An optical fiber cleaving tool comprising:

means for securing in a predetermined position on the tool a fiber optic connector end surface having therein an aperture from which protrudes an optical fiber end portion; and

means for cleaving said optical fiber end portion at a transverse plane disposed in predetermined positional relationship with respect to said aperture in said end surface of the fiber optic connector, said cleaving means including resilient biasing means for urging said cleaving means into

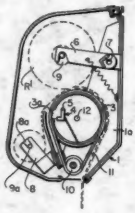
resilient contacting relationship with said fiber optic connector end surface.

4,621,755

DEVICE FOR DISPENSING AND SIMULTANEOUSLY CUTTING ROLLED UP MATERIALS IN WEBS

Maurice Granger, 17 rue Marcel Pagnol, 42270 Saint Priest en Jarez, France

Filed Mar. 14, 1985, Ser. No. 711,805
Claims priority, application France, Mar. 21, 1984, 84 04695
Int. Cl.[4] B26F *3/02*; A47K *10/36*
U.S. Cl. 225—96 **5 Claims**



1. Device for the simultaneous dispensing and cutting of bands of wound materials, having at least one roll of material (R1) which is mounted so that it can rotate freely on a support means and is applied with pressure directly onto a drum (3) with a non-slip surface so that a sheet of predetermined length is automatically dispensed and cut by simple manual tension on the band of material extending from the device, the cutting is performed by an indented cutting device (4) associated with the drum (3) and which extends outside of the drum during a cutting operation which is activated by putting the drum in rotation by pulling on the material, during the cutting operation the cutting device penetrates into the material stretched across the drum on both sides of the cutting device, whereby the cutting device is articulated so that is can elastically return into the drum after the cut, when the drum is rotated back to its initial position a new band of material extends from the device, characterized in that the cutting device is connected by a roller (18) to a cam (16) which is fixed to the support means (2) the cam is constructed on a side of the support means (2) and can receive and guide with free and limited rotation a shock protecting means (19) having a catch means (20–21) and a stop pin means (22), the drum (3) is provided with a side facing the shock protecting means (19) and with stops (23–24) which cooperate with the catch means and the stop pin means (20, 21, 22) of the shock protecting means (19) permitting the starting of the drum after the cut without banging of the blade carrier and facilitates braking and repositioning the drum after a new cut.

4,621,756

WEB FEEDING MECHANISM

Michael K. Bullock, Matthews; Dennis R. Hedrick, High Point; Richard H. Marvin, Concord, and Edmund H. James, III, Matthews, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1984, Ser. No. 627,303
Int. Cl.[4] B65H *20/02, 20/20, 20/40, 23/14*
U.S. Cl. 226—76 **5 Claims**

1. A printer comprising:

(a) a frame;

(b) a print mechanism for performing printing operations on a print medium;

(c) means for mounting said print mechanism on said frame; and

(d) print medium feeding mechanism adapted to be bidirectionally driven for bidirectionally feeding said print medium past said print mechanism so that printing operations can be performed on said print medium by said print mechanism, said print medium feeding mechanism comprising

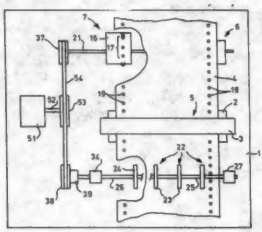
(1) alignment and forward feed apparatus engaging said print medium for positioning said print medium at a predetermined lateral location with respect to said print mechanism when said print medium is fed in either the forward or reverse direction, and for feeding said print medium in a forward direction past said print mechaism,

(2) means for mounting alignment and forward feed apparatus on said frame downstream of said print mechanism relative to the direction of forward feed of said print medium,

(3) reverse feeding apparatus engaging said print medium for feeding said print medium in a reverse direction past said print mechanism, and for tensioning said print medium when said print medium is driven in a forward direction, said reverse feed apparatus comprising

(i) at least one pair of pressure wheels in nipping engagement, each of said pressure wheels being flexible in the axial direction so as to permit uninhibited lateral movement in the axial direction relative to said pressure wheels such that no lateral alignement forces are exerted on said print medium by said pressure wheels, and so that alignment relative to said print mechanism is controlled wholly by said alignment and forward feed apparatus,

(ii) means for rotatably mounting said pair of pressure wheels on said frame upstream of said print mecha-



nism relative to the direction of forward feed of said print medium and so that said pressure wheels abut against opposite surfaces of said print medium being fed by said alignment and forward feed apparatus whereby forward movement of said print medium causes forward rotation of said pressure wheels,

(iii) brake means for restricting the rotation of at least one of said pressure wheels only in a forward direction to exert a retarding force on the print medium while being fed in a forward direction to thereby tension said print medium as it passes said print mechanism, and

(iv) one way coupling means adapted to be coupled to a drive means to drive at least one of said pressure rolls in a reverse direction only to feed said print medium in a reverse direction; and

(4) bidirectional drive means for intercoupling and driving said alignment and forward feed apparatus and said pressure rolls, rotation of said bidirectional drive means in a forward direction driving said alignment and forward feed apparatus to align and feed said print medium in a forward direction as said brake means exerts a retarding force on said print medium via said pressure wheels to tension said print medium, and rotation of said bidirectional drive means in a reverse direction engaging said one way coupling means and driving at least one of said coupled pressure rolls to feed said print medium in a reverse direction without exerting any lateral alignment forces thereon, said alignment and

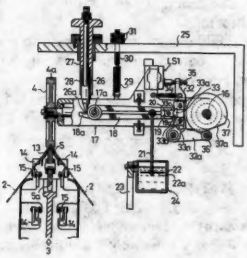
forward feed apparatus providing the only lateral alignment forces on said print medium and exerting a retarding force on said print medium to tension said print medium.

4,621,757

SIGNATURE THICKNESS DISCRIMINATING APPARATUS

Tatsuo Osako, Urawa, Japan, assignor to K.K. Osako Seisakusho, Saitama, Japan

Filed May 21, 1985, Ser. No. 736,534
Claims priority, application Japan, May 29, 1984, 59-110381
Int. Cl.[4] B21J *15/28*; B42C *13/04*
U.S. Cl. 227—1 **2 Claims**



1. Signature thickness discriminating apparatus on a saddle-wired binding apparatus including

a deflector means for guiding a signature set of normal thickness into a passage for a signature set of normal thickness, and for guiding a signature set of abnormal thickness into a passage for a signature set of abnormal thickness; and

a stitcher for a signature set of normal thickness;

the signature thickness discriminating apparatus comprising:

a horizontally-extending arm supported pivotably at its base end on a machine frame,

a larger-diameter sensor wheel provided rotatably at a free end of said arm;

a smaller-diameter sensor wheel supported rotatably on said machine frame in such a manner that the larger-diameter sensor wheel can contact the circumferential surface of said smaller-diameter sensor wheel from above;

a claw lever having a locking claw at the rear end thereof, extending along one side surface of said arm and supported pivotably at an intermediate portion thereof on said arm;

a power point working rod fixed to said machine frame so as to engage from above with the upper surface of the portion of said claw lever which is before said pivotably-supported portion thereof;

a dog lever having a dog suppoted pivotably on said machine frame, impelled slidingly by a rotary cam and therefore moved pivotably, and positioned so that said dog lever cannot be turned when said locking claw engages with said dog, and can be turned when said locking claw is not in engagement therewith;

a starting switch means disposed in opposition to an upper end of said dog lever and adapted to be controlled in accordance with the pivotal movement of the upper end of said dog lever;

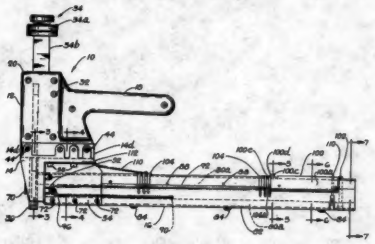
and solenoids connected to said deflector means and said stitcher and adapted to operate said deflector means and said stitcher in accordance with a control signal from said starting switch means.

4,621,758

NAILING MACHINE

Edgar P. Anstett, 21 Lakewood Pl., Highland Park, Ill. 60035

Filed Sep. 13, 1985, Ser. No. 775,783
Int. Cl.[4] B25C *5/06, 5/11*
U.S. Cl. 227—147 **10 Claims**



1. A manually operated nailing machine comprising: a body portion having a handle for enabling an operator to maneuver the machine into a nailing position; reciprocatable plunger means including a nail driving blade positioned in said body portion; a stationary foot secured to the body portion, said foot having a nail gateway formed therein; nail feeder means secured to the foot, said nail feeder means including a strip of interconnected nails adapted to be sequentially advanced one at a time through the nail gateway of the foot into a position to enable each nail of the strip to be driven into a workpiece by the nail driving blade; and nail guide and positioning means for sequentially receiving a single nail from the nail feeder means as it is passed through the nail gateway of the foot, said nail guide and positioning means including an outer stationary driving blade guide member secured to said foot, an inner stationary driving blade guide member secured to the outer stationary driving blade guide member, and a movable driving blade guide member slidably supported on the outer stationary driving blade guide member in alignment with the inner stationary driving blade guide member and being movable between a normally extended nail receiving position and a nail contacting and aligning position, said outer and inner stationary driving blade guide members, and said movable driving blade guide member together forming a driving blade guideway therebetween, said inner stationary driving blade guide member and said movable driving blade guide member being provided with slots which together form a nail gateway having dimensions substantially equal to the dimensions of the nail gateway of the foot when the movable driving blade guide member is in its normally extended nail receiving position, said nail gateway formed by said slots having dimensions substantially smaller than the nail gateway of the foot when the movable driving blade guide member is in a nail contacting and aligning position for maintaining a single nail in proper position in said driving blade guideway when the machine is in a nail driving position and a nail is to be driven into a workpiece.

4,621,759

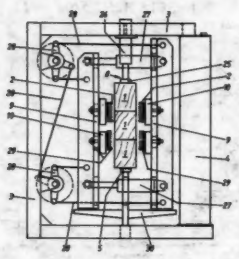
APPARATUS FOR JOINING MUTUALLY CONTACTING BEAMS OR THE LIKE BY MEANS OF NAIL SLABS

Johann Wolf, Scharnstein, Austria, assignor to Johann Wolf Gesellschaft m. b. H., Scharnstein, Austria

Filed May 16, 1985, Ser. No. 734,537
Claims priority, application Austria, May 16, 1984, 1619/84
Int. Cl.[4] B27F *7/15*
U.S. Cl. 227—152 **10 Claims**

1. Apparatus for connecting a plurality of longitudinal beams into girders by means of prefabricated nail slabs, comprising means for feeding a plurality of superposed beams into a nailing station, means for supporting said beams from below in said nailing station, means for pressing downwardly on said beams in said nailing station, means for pressing prefabricated

nail slabs into said beams from opposite sides of said beams thereby to integrate said beams into a girder, rollers rotatable about horizontal axes disposed on opposite sides of said sup-



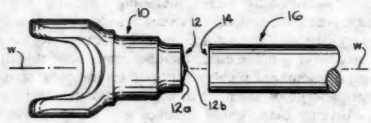
porting means, and yieldable means urging said rollers to an elevation higher than said supporting means, said yieldable means yielding against the pressure of said downwardly pressing means to lower said beams onto said supporting means.

4,621,760

METHOD OF PRODUCING A FRICTION WELDED ARTICLE

Wendell B. King, Bluffton; Ronald I. Rhoads, Fort Wayne, and Robert H. Tarbox, Huntertown, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Jul. 9, 1985, Ser. No. 753,315
Int. Cl.[4] B23K *20/12, 20/24*
U.S. Cl. 228—112 **6 Claims**



1. A method of friction welding first and second metal components about a welding axis, the first component having an interface surface to be positioned in facing relation to an interface surface provided on the second component, said method comprising the steps of:

(a) shaping the interface surface of the first component in a generally convex configuration relative to a plane located perpendicular to the welding axis;

(b) providing the central portion of said convex-shaped interface surface with a raised button extending axially outwardly a predetermined distance from said convex-shaped interface surface;

(c) positioning the interface surface of the first component in spaced apart, facing relationship with the interface surface of the second component; and

(d) friction welding the first and second components at their interface surfaces.

4,621,761

PROCESS FOR FORMING UNUSUALLY STRONG JOINTS BETWEEN METALS AND CERAMICS BY BRAZING AT TEMPERATURES THAT DO NO EXCEED 750 DEGREE C.

Joseph P. Hammond; Stan A. David, both of Knoxville, and John J. Woodhouse, Crossville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 4, 1984, Ser. No. 677,955
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—124 **39 Claims**

1. A process for brazing high melting point iron-containing metals to ceramics at temperatures not greater than 750° C. comprising, in a vacuum:

(a) cleaning a surface to be brazed of a ceramic to remove surface oxygen therefrom;

(b) coating said cleaned surface of ceramic with a thin layer of an active substrate that is from 0.3 to 1 micron thick;

(c) cleaning a surface to be brazed of a high-melting point iron-containing metal to remove any surface carbon therefrom;

(d) coating said surface to be brazed of said metal with a thin noncarbon containing metal coating to prevent any carbon contained in said metal from reacting with a brazing alloy;

(e) forming an assembly of said ceramic surface and said metal surface in sandwich fashion with a brazing alloy placed therebetween, said brazing alloy having a melting point of less than 750° C., wetting said metal surface and forming a trimetal intermetallic with said active substrate upon brazing;

(f) heating said assembly to the melting point of said brazing alloy for a period suitable to permit flow and wetting by said brazing alloy; and

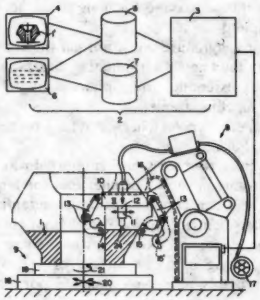
(g) cooling said assembly to form a brazed joint between said ceramic surface and said metal surface.

4,621,762

DEVICE FOR BUILDING UP A WORKPIECE BY DEPOSIT WELDING

Helmut Bronowski, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Aug. 7, 1985, Ser. No. 763,427
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430114
Int. Cl.[4] B23K *31/02, 9/04, 37/06;* **B22D** *11/00*
U.S. Cl. 228—215 **5 Claims**



1. An apparatus for building up a workpiece by deposit welding, comprising a support device for the workpiece, a welding head for depositing filler material, a cooled form shoe means for defining the growing workpiece wall, said shoe means including a plurality of cooled form shoes respectively positioned on each side of the workpiece wall, each of said form shoes being independently movable and being movable transversely to said workpiece wall, and means for moving the support device together with the workpiece relative to the welding head and the form shoes.

3. An apparatus for the build up of a workpiece with at least one wall by deposit welding, comprising a support device for the workpiece, a welding head for depositing the filler material, said welding head mounted to a welding head support, a movement means for producing relative movement between the welding head and the support device together with the workpiece, a cooled form shoe positioned on each side of the workpiece wall wherein each of said form shoes defines a

portion of the growing workpiece wall, and each of said form shoes is connected to said welding head support by an articulated arm so that each form shoe is movable relative to the workpiece wall.

4,621,763

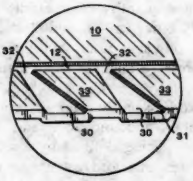
CONTAINER END CONSTRUCTION

Arne H. Brauner, Washington Crossing, Pa., assignor to International Paper Company, New York, N.Y.

Filed Sep. 12, 1985, Ser. No. 775,293

Int. Cl.[4] B65D *3/18*

U.S. Cl. 229—5.5 **8 Claims**



1. A blank for forming a side wall and a portion of an end closure of a tube type container, the blank being formed of resilient, stiff and bendable sheet stock, such as paperboard, the blank including a lower rim and a band running therealong, the band having a plurality of generally wedge shaped scores therein, the scores being spaced from each other along said band, each score including a narrow end and a widest end, the widest ends of the scores being at the rim of the band, a continuous score of substantially uniform width running parallel to said rim and spaced therefrom and contiguous with the narrow ends of the scores, the band being adapted to be bent inwardly to form folds after the blank has been formed into a tube, the band also being adapted to contact and seal against an end closure disc or panel, so that the folds in the band are at least substantially contained within the wedge shaped scores to yield an improved seal of the inwardly folded band and the closure disc or panel.

4,621,764

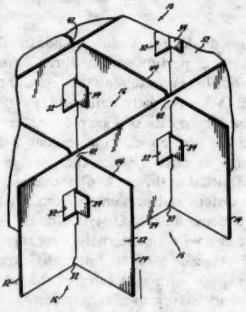
PARTITION ASSEMBLY WITH INTERLOCKS HAVING GLUED TABS

Don C. Ragon, Whitefish Bay, Wis., assignor to Rock-Tenn Company, Norcross, Ga.

Filed Mar. 20, 1985, Ser. No. 714,127

Int. Cl.[4] B65D *5/48*

U.S. Cl. 229—15 **12 Claims**



1. A partition assembly having longitudinal and cross partition strips, interlocking means for joining said longitudinal and cross strips such that said strips cross and are interlocking and generally orthogonal in an expanded configuration, wherein said interlocking means comprises a first slot in a longitudinal strip and a second slot in a cross strip, said first and second slots being in engagement to interlock the cross strip with the longitudinal strip along a line of intersection, at least one of said strips having a tab located along the line of intersection of said strips with a side surface of said tab adhered to a side wall of the other strip, said tab being foldable generally along the line of intersection of said strips to accommodate unfolding of said partition assembly between collapsed and expanded configurations.

4,621,765

TRAY STACKING WIRE

Stanley G. Ortel, Buffalo, N.Y., assignor to Better Wire Products, Inc., Buffalo, N.Y.

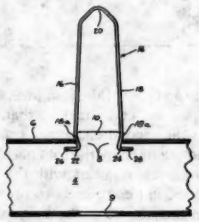
Division of Ser. No. 934,216, Aug. 16, 1978, Pat. No. 4,227,642.

This application Oct. 14, 1980, Ser. No. 196,329

The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.

Int. Cl.[4] B65D *5/46, 21/02*

U.S. Cl. 229—52 AW **4 Claims**



1. A unitary resilient stacking wire adapted for stacking corrugated paperboard trays and the like on top of one another, said stacking wire including a pair of legs and a bight portion with corresponding ends of said legs being joined by said bight portion into a substantially planar U-shape configuration, said legs being resiliently biased away from each other and diverging from said bight, each of the nonjoined ends of said legs terminating in a foot extending laterally from each respective leg, each said foot being unidirectional and extending in opposite directions with respect to one another and positioned substantially within the plane of said legs and bight portion, each said foot terminating in a prong extending laterally therefrom in order to permit bending thereof and positioned on the same side of the plane of said legs and said bight portion, wherein said prongs extend obliquely and in outwardly diverging relation and lie in a plane disposed at a substantial angle to the plane of said legs and said bight portion.

4,621,766

TRIPLE-END CONTAINER AND BLANK THEREFOR

Jack A. McClure, Garden City, Kans., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Jun. 28, 1985, Ser. No. 750,412

Int. Cl.[4] B65D *5/46*

U.S. Cl. 229—52 B **8 Claims**

1. A one-piece corrugated blank for forming a container comprising, in combination,

a substantially rectangular bottom panel having opposite ends and sides;

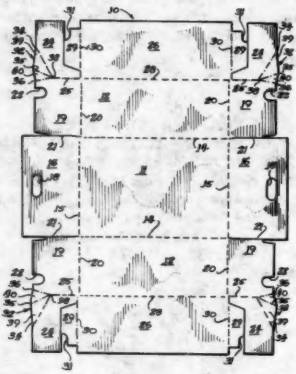
a side panel hingedly attached to each side of the bottom panel;

a first end panel having a hand-hold slot formed therein hingedly attached to each end of the bottom panel and;

a second end panel hingedly attached to each end of each side panel and sized to extend approximately half way across the first end panel, each second end panel having a

cutout complementary to the hand-hold slot in the first end panel; and

an extension attached by a hinge to each second end panel and having a plurality of fold lines forming panels between the second end panel and the extension adjacent an outer portion of the hinge, the fold lines being offset from



the hinge line and one of the fold lines forming a recessed edge of the second end panel so that, upon folding the extension on the second end panel back about the hinge line, the panels defined by the fold lines will form one-half of an enclosure that registers with the hand-hold slots in the first and second end panels to prevent ingress therethrough into the interior of the assembled container.

4,621,767

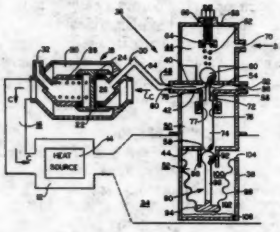
COOLING CONTROL SYSTEM APPARATUS AND METHOD

James A. Denneny, Jr., Scottsdale, and Charles M. Rowland, Phoenix, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 359,544, Mar. 18, 1982, Pat. No. 4,463,897. This application Jan. 12, 1984, Ser. No. 570,134

Int. Cl.[4] G05D *27/00*

U.S. Cl. 236—92 R **10 Claims**



8. A regulating valve comprising:

a hollow housing including at least a pair of walls dividing the interior thereof into at least three chambers, one of said pair of walls bounding a first and a second of said chambers defining an aperture therethrough; said housing defining an inlet, an outlet, and a vent opening respectively to said first, said second, and a third of said chambers;

a valve element received in said first chamber and movable between a first position sealingly engaging said one wall at said aperture and a second position wherein said valve element is spaced from said one wall;

a first stem member movably carried by said housing and extending into said first chamber, said first stem member carrying a spring seat confronting said valve element;

a coil compresion spring extending between said spring seat and said valve element to yieldably bias the latter toward said first position thereof;

an annular bellows member disposed in said third chamber, said bellows member cooperating with said housing to substantially divide said third chamber into a pair of coannular variable-volume cavities, the radially outer of said pair of coannular cavities being closed;

a predetermined quantity of an elastic medium disposed in said radially outer cavity, said elastic medium expanding and contracting said outer cavity in response to temperature and pressure changes thereof to move said bellows member;

a stem push rod assembly drivingly coupling with said bellows member and movably and sealingly extending through an opening defined by a second of said pair of walls, said stem push rod assembly extending through said second chamber, to cooperate with said valve element to shift the latter between said first and said second positions in response to respective contraction and expansion of said outer cavity.

4,621,768

DEVICE FOR DIFFUSING VOLATILE LIQUIDS

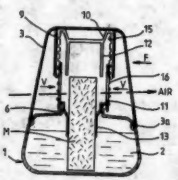
Jean-Francois Lhoste, Chartres, and Thierry Delage, Paris, both of France, assignors to Reckitt & Colman S.A., France

Filed Oct. 7, 1985, Ser. No. 784,758

Claims priority, application France, Oct. 9, 1984, 84 15473

Int. Cl.[4] A61L *9/12*

U.S. Cl. 239—44 **1 Claim**

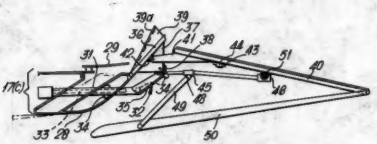


1. A diffusing device for volatile liquids to affect the immediate environment, or perfume or deodorise a room; such device comprising a bottle (1) containing the liquid for diffusion (2), in which a wick (M) is partially immersed; a cover cap (3) fitted to the said bottle by means of a snap-on system (*3a*), capable of being rotated but not moved in a vertical direction, and provided with slits or ports (F) for the passage of air; a wick-holder (11–13) fitted to the neck (6) of the said bottle by means of a snap-on system and prevented from rotating, and taking the form of a sleeve provided with slits or ports (V) for the passage of air and with an external screw thread; and an internal cap (10) consisting of an internally-threaded skirt (15) designed to engage with said external thread (16) of the said wick-holder, and having in addition vertical grooves on the outside (14) designed slidably to engage with a vertical sleeve (9) which forms an integral part of the upper portion of the aforesaid cap (3), said internal cap further consisting of an internal sleeve (12) forming a sealing-cap for aforesaid wick.

4,621,769
TURBOMACHINE EJECTOR NOZZLE

Gary F. Szuminski, Marietta, Ga., assignor to Rolls-Royce Inc., New York, N.Y.

Filed Aug. 24, 1982, Ser. No. 410,984
Int. Cl.[4] F02K 1/12
U.S. Cl. 239—265.39 4 Claims



1. An exhaust nozzle for a gas turbine comprising a duct extending along an axis and having, at a downstream end thereof, a mechanism for varying the geometry and area of the nozzle, the mechanism comprising: a translatable member movable in a direction along the length of the duct; a plurality of first flaps spaced circumferentially around the axis of the duct each first flap being pivotally attached at its upstream end to the member and being provided with a cam follower that co-operates with a cam that is fixed relative to the duct thereby to define the attitude of each first flap relative to the duct; a plurality of first seal plates interposed circumferentially between the first flaps to close off the circumferential gap between juxtaposed first flaps; a plurality of circumferentially spaced second flaps located downstream of the first flaps, each second flap being pivotally attached at its upstream end to a first flap by means which, at least in one position of the first flaps, defines an air inlet opening between the downstream end of each first flap and the upstream end of each second flap; a plurality of second seal plates interposed circumferentially between the second flaps to close off the circumferential gap between juxtaposed second flaps; a plurality of third flaps each of which is pivotally attached at its downstream end to a downstream end of one of the second flaps; a plurality of links, each of which is pivotally attached at one end to an upstream region of a third flap and pivotally attached at its other end to structure which is fixed relative to the duct; a ring which is fixed relative to the duct and encircles the second flaps at a region intermediate the upstream and downstream ends of the second flaps; and a constraining means which co-operates with the fixed ring to provide a fulcrum about which each second flap rocks to assume various attitudes relative to the duct.

4,621,770
PLANT WATERING/MISTING DEVICE

Michael D. Sayen, 510 Emma St., Hancock, Mich. 49930

Continuation of Ser. No. 330,234, Dec. 14, 1981, abandoned. This application Jan. 6, 1984, Ser. No. 568,821
Int. Cl.[4] B05B 7/26, 7/02
U.S. Cl. 239—304 3 Claims

1. A self-contained, portable plant watering/misting device comprising:

a portable reservoir for containing a liquid to be dispensed onto plants;

a pistol-shaped housing separate from said reservoir and adapted to be held in a human hand, said housing including a handle portion and a barrel portion extending from said handle portion;

flexible fluid conduit connecting said reservoir with said housing;

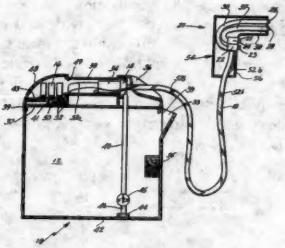
pumping means on said reservoir for conveying said liquid from said reservoir to said housing through said conduit;

a battery housing removably mounted on said reservoir including rechargeable batteries located therein, said battery housing including first electrical quick disconnect connector means electrically connected to said batteries in said housing;

mating quick disconnect connector means mounted on said reservoir and electrically connected to said pumping means whereby when said battery housing is mounted on said reservoir with said first and mating electrical quick disconnect means engaged, said batteries provide power to said pumping means which is mounted on said reservoir outside of said battery housing, and whereby when said battery housing is removed from said reservoir, it can be electrically connected to a charger for charging;

first and second normally closed valves supported adjacent one another in said handle portion of said housing, said valves being independently actuable;

spraying means supported in said barrel portion for dispensing said liquid in spray form, said spraying means being fluidly connected through said first valve to said flexible conduit, whereby when said first valve is opened, said



liquid flows through said first valve and said spray means to be dispensed in spray form;

stream means for dispensing said liquid in stream form, said stream means being fluidly connected through said second valve to said flexible conduit, whereby when said second valve is opened, said liquid flows through said second valve and said stream means to be dispensed in stream form;

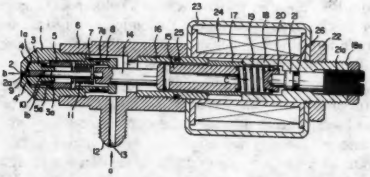
a fertilizer dispenser positioned on one wall of said reservoir and including an open top;

said reservoir including a fill opening located on said one wall and spaced generally above said fertilizer dispenser whereby as one fills said reservoir with water through said fill opening, the water flows onto fertilizer located in said fertilizer dispenser and whereby fertilizer can be poured into said dispenser through said fill opening.

4,621,771
FLOW CONTROL NOZZLE

Yasutsune Chiba; Shizuo Arima, both of Tokyo; Katsumi Nozawa, Yokohama, and Hideo Nomura, Kanagawa, all of Japan, assignors to Taisan Industrial Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 450,377, Dec. 16, 1982, abandoned. This application Feb. 25, 1985, Ser. No. 704,736
Claims priority, application Japan, Feb. 16, 1982, 57-22116
Int. Cl.[4] F02M 51/06; B05B 1/30
U.S. Cl. 239—585 3 Claims



1. A flow control nozzle comprising (1) a joint body having an inlet and an axial through-hole, a nozzle chip means

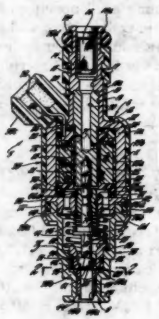
mounted at one end of the joint body and having an orifice at the center of the front end, a cone chip means supported in abutting engagement with a tapered face within a cavity of said nozzle chip means and having turning grooves, (2) a control rod means supported slideably in a center through-hole of the cone chip means with a gap around the circumference of the control rod for smooth motion thereof, and at one end biased toward an electromagnetic plunger by one spring and at the other end biased towards a rest position to close the orifice of the nozzle chip means by the biasing force of another spring in the direction opposite to that biased by said one spring, (3) a plunger case mounted at the end of the joint body opposite to the nozzle chip means, the electromagnetic plunger being fitted for sliding motion in the plunger case, an electromagnetic coil arranged so as to enclose the periphery of the plunger case, and (4) an electronic control circuit which permits variable adjustment of at least one of a frequency and a duty cycle of a pulse current for exciting said electromagnetic coil, to reciprocate said control rod, with said control rod being shifted away from said rest position to form a second gap between an end of said control rod and said nozzle chip while said electromagnetic coil is energized thereby avoiding chattering, whereby said orifice has a mean effective opening adjusted to a desired value to permit variable adjustment of the quantity of fluid sprayed by the nozzle.

4,621,772

ELECTROMAGNETIC FUEL INJECTOR WITH THIN ORIFICE DIRECTOR PLATE

James S. Blythe; Michael J. Dinkel, both of Rochester, and Donald D. Stoltman, Henrietta, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 6, 1985, Ser. No. 730,465
Int. Cl.[4] F02M *51/06*
U.S. Cl. 239—585 **3 Claims**



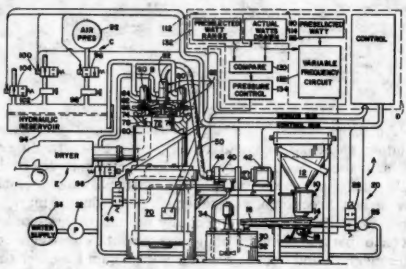
1. An orifice director plate for use in an electromagnetic fuel injector of the type used in the fuel injection system for an internal combustion engine, said orifice director plate including a disk in the form of a body of revolution about an axis and of a predetermined thickness an having opposed surfaces, a plurality of equally spaced apart, circular, through orifice passages located on a circumference of a base circle positioned concentric to said axis and aligned at right angles to said opposed surfaces, and the material of said disk surrounding each of said orifice passages being angled out of the normal plane of said disk so that said orifice passages are inclined at a predetermined angle to said axis.

4,621,773

OPERATION AND CONTROL SYSTEM FOR COMMINUTION EQUIPMENT

Robert Calevich, Richmond Heights, and George V. Chinchar, Mentor, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 21, 1984, Ser. No. 673,909
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—21 **12 Claims**



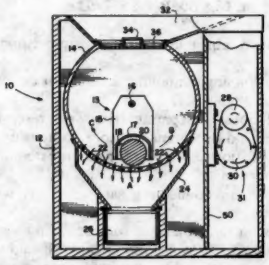
1. A method of comminuting comprising:
rotating a rotor relative to a stator with an electric motor;
feeding a mixture of liquid and pellets into a comminuting zone between the rotor and stator to be comminuted thereby;
monitoring the power expended by the electric motor to cause the relative rotation between the rotor and stator;
comparing the monitored power with a preselected set point;
in response to the monitored power being below the set point, pressing the rotor and stator together into intimate physical contact with a selected, constant pressure; and,
in response to the monitored power exceeding the set point, reducing the pressure with which the rotor and stator are pressed together until the monitored power drops below the set point such that the power expended by the electric motor remains substantially constant at the set point.

4,621,774

PULVERIZER FOR CREMATED REMAINS

Paul F. Rahill, Longwood, Fla., assignor to Industrial Equipment & Engineering Co., Orlando, Fla.

Continuation-in-part of Ser. No. 543,356, Oct. 19, 1983, abandoned. This application Nov. 16, 1984, Ser. No. 672,584
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—84.2 **1 Claim**



1. A pulveriser for cremated remains having non-reducible matter contained therewith comprising:
a horizontally mounted cylindrical drum having a closable top opening therein and a plurality of perforations over a

lower sector thereof, said closable top opening being closed by a dust proof cover removable disposed in said top opening;

a free cylindrical reducing bar disposed within said drum and parallel to the axis of said drum along said lower section;

a drive shaft operatively disposed within and concentric with said drum;

a yoke connected to said drive shaft for engaging and captivating said free reducing bar, and having clearance between said yoke and said reducing bar for permitting said reducing bar to move vertically in said yoke means;

motor operated reciprocating drive means connected to said drive shaft for moving said yoke means in a reciprocating motion over said perforations in said lower sector thereby causing said free reducing bar to roll over said perforations; and

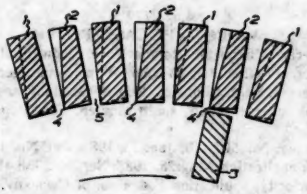
a removable drawer disposed beneath said perforate sector of said drum for receiving reduced remains, said drawer and said cover including means for prevention of escape of dust during reduction of remains.

4,621,775

HIGH-SPEED MILL FOR GRINDING BIOMASS AND LIKE MATERIAL

Jan Åbom, Poppelgatan 12, S-421 74 Västra Frölunda, and Bengt Törnqvist, Banérgatan 3, S-114 56 Stockholm, both of Sweden

Filed Sep. 28, 1981, Ser. No. 306,636
Claims priority, application Sweden, Oct. 16, 1980, 8007266
Int. Cl.[4] B02C *13/282, 18/16*
U.S. Cl. 241—86.1 13 Claims



1. A high speed mill for grinding biomass and like material, comprising,

a rotary impeller having vane means, said vane means being movable in a path which imparts rotary motion to the material which is to be ground,

a plurality of cutting plates disposed adjacent to the path of the vane means for cutting material which is moved thereagainst by the vane means,

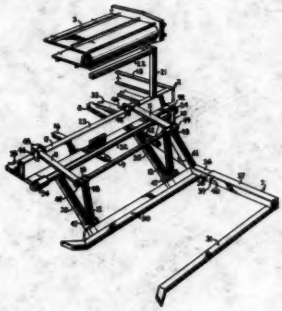
each of said cutting plates having a cutting edge which faces toward the path of the vane means, said cutting edge comprising a plurality of chip-breaking cutting blades, each of said cutting blades having a sharpened edge portion which extends transversely with respect to the path of the vane means, said cutting blades on each said cutting plate being spaced from each other in a direction which is sideways with respect to the path of the vane means, said cutting blades of adjacent cutting plates being displaced relative to each other in a direction which is sideways with respect to the path of the vane means.

4,621,776

ROUND BALE HANDLER

Dewey L. Hostetler, Harper, Kans., assignor to DewEze Manufacturing, Inc., Harper, Kans.

Continuation of Ser. No. 488,273, Apr. 25, 1983, abandoned.
This application Mar. 22, 1985, Ser. No. 715,751
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—101.7 10 Claims



1. A bale handler for manipulating large cylindrical bales, the bale handler comprising:

(a) a bale support frame for supporting a large cylindrical bale of bale material, said frame having a front end, a rear end, and opposite left and right laterally spaced sides;

(b) axle means for supporting ground engaging wheels, said axle means having a longitudinal axis that is aligned generally perpendicularly to said sides of said frame connected at a position between said front and, and said axle means being connected to said frame at a position that is located between said front and rear ends in order to support a bale generally above said axle means;

(c) a rotatable ground engaging wheel positioned on said axle means on each of said opposite sides of said frame, each wheel being spaced substantially outwardly from its respective side of said frame in order to resist lateral tipping of said handler;

(d) a bale lift device on one of said sides, said bale lift device being pivotally connected to said frame by a lift device pivotal connection so as to pivot about a generally horizontal pivot axis which is generally aligned parallel to said one of said sides, so that said lift device engages said bale and lifts same onto said frame, said lift device being positioned to operate substantially across one of said wheels in order to resist said tipping during operation of said lift device;

(e) a motor connected between said frame and said bale lift device and operable to pivot said lift device to lift said bale; and

(f) a bale support arm extending parallel to and spaced from said pivot axis, said bale support arm being pivotally connected to said frame by a frame link and being pivotally connected to said bale lift device by a lift link, said frame link and said lift link each having a hinge end, the hinge ends being connected to each other, the hinge ends also cooperating with each other and with said bale support arm so as to form a hinge joint associated with said bale support arm, said hinge joint and said bale support arm being pivoted in a generally upward direction upon pivoting of said lift device to lift a bale, said bale support arm being positioned between portions of said bale lift device and said frame, so that said bale support arm raises, and engages said bale during lifting in order to prevent said bale from sagging between said bale lift device and said frame during said lifting.

4,621,777

PRE-FOLDED PACKAGED TAPE FOR ELECTRICAL CONDUCTORS

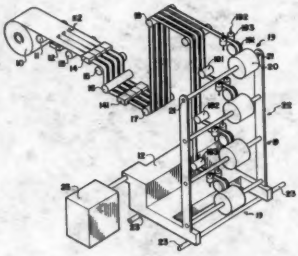
Lawrence O'Connor, P.O. Box 489, Lot 6, Clearwater Bay, Ontario, Canada

Filed Dec. 6, 1984, Ser. No. 679,117

Claims priority, application United Kingdom, Dec. 13, 1983, 8333176

Int. Cl.[4] B65H *18/28, 35/02*

U.S. Cl. 242—1 2 Claims



1. A package of tape characterized in that the tape is slit from a laminate solely consisting of a metallic foil layer and an insulating dielectric plastics layer such that the tape comprises solely said foil layer and said dielectric layer with longitudinal edges thereof which are directly overlying, said tape being folded such that one edge along the length thereof lies flat back against a surface of the tape to form at said edge a portion of tape which is at least double the thickness of the laminate, the package being formed from a plurality of wraps of said tape arranged such that the tape repeatedly traverses along the length of the package.

4,621,778

APPARATUS FOR AUTOMATICALLY DISCHARGING COPS FROM SPINNING MACHINES

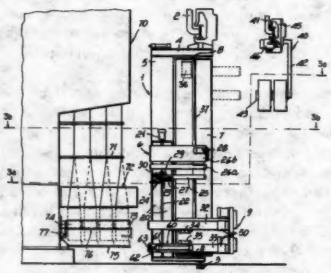
Luciano Paravella, Pavia, and Luigi Figini, Varedo, both of Italy, assignors to Snia Fibre S.p.A., Cesano Maderno, Italy

Filed Dec. 28, 1984, Ser. No. 687,429

Claims priority, application Italy, Dec. 30, 1983, 24456 A/83

Int. Cl.[4] B65H *67/04*

U.S. Cl. 242—35.5 A 13 Claims



1. A doffing and donning apparatus for automatically feeding empty spools and withdrawing cops to and from a textile yarn winding system having a plurality of winding spindles disposed on a support surface, the axis of each of said spindles being perpendicular to said support surface, said apparatus comprising:

(a) a track which is disposed parallel to said support surface;

(b) a main structure supported for horizontal movement on said track, said main structure including a first vertical column which is fixed with respect to said main structure and a second vertical column which is pivotable about a vertical axis;

(c) a single spool changing assembly supported for vertical movement on said second vertical column, said spool changing assembly including two elongated horizontal parallel bodies for doffing completed cops from the spindles and donning empty spools onto the spindles, said spool changing assembly being mounted on a support means which is movable vertically on said second vertical column, said spool changing assembly being pivotable through a rotation of at least 180° about said vertical axis passing through a pivotal connection between said second column and said main structure, said two elongated bodies being aligned in a vertical plane with a vertical distance between them being greater than the radius of a completed cop;

(d) a thread cutting and reattaching assembly supported by said first vertical column and having means for cutting the yarn, sucking continuously the yarn during the doffing and donning operations of said spool changing assembly, and reattaching the yarn on the donned empty spools, said thread cutting and reattaching assembly being supported on a horizontal expansible member, which is extensible in a direction parallel to the axes of said spindles, said horizontal expansible member being supported by service support means disposed on said first vertical column, said service support means being movable vertically along said first vertical column independently of said spool changing assembly; and

(e) at least one aerial carrier movably supported on an elevated track for carrying empty spools and cops to and from a storage area to provide said spool changing assembly with empty spools and to take from said spool changing assembly complete cops, said aerial carrier being positionable to transfer spools and cops to and from said horizontal bodies of said spool changing assembly and said aerial carriage including at least one horizontal elongated body for holding cops and empty spools.

4,621,779

VIDEO TAPE CASSETTE

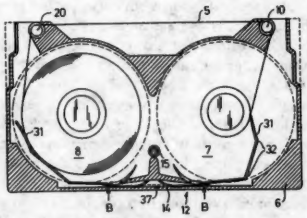
Horst Fitterer, Mannheim; Roland Roos, Ludwigshafen; Wulf Muenzner, Frankenthal; Werner Balz, Limburgerhof, and Heinz Berger, Kehl, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 507,110, Jun. 23, 1983, Pat. No. 4,557,433. This application May 28, 1985, Ser. No. 738,413

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1982, 8218184[U]

Int. Cl.[4] G03B *1/04;* G11B *15/32, 23/02*

U.S. Cl. 242—199 3 Claims



1. A tape cassette, in particular a video tape cassette, comprising a cassette housing containing

two flanged reels on which a magnetic tape having a front side and a rear side is wound into rolls, and, between the

flanges of each reel, at least one spring member which constantly bears against the periphery of the tape roll, and at least one tape guide means having a conductive surface contacting the rear side of the tape,

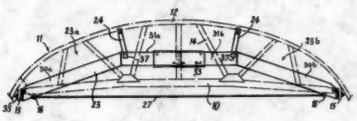
each said spring member being a strip of thin resilient and conductive foil material having a thickness of from 100 to 300 micron and being arranged in the cassette housing in such a way that said strip makes contact with the periphery of the associated roll in the vicinity of the point where the tape joins or leaves the roll, the material and the form of said strip being such that said strip exerts a relatively low pressure in the range from about 1 to 200 mN at said point on the periphery of said roll, and means for connecting the conductive surface of said tape guide means to said strip whereby the outer tape windings are held on the periphery of each roll and electrical contact is maintained between said strip and the associated outer winding such that the tape is discharged through said strip of conductive foil material contacting the front side of said tape and said conductive guide means contacting the rear side of the tape.

4,621,780

METHOD AND DEVICE FOR TEMPORARILY ENLARGING THE OPENING OR HATCH AREA OF A STRUCTURAL FRAME OF AN AIRCRAFT

Francois Doyhamboure, Merignac, and Jean Morand, Bordeaux, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jan. 16, 1985, Ser. No. 691,928
Claims priority, application France, Jan. 24, 1984, 84 01054
Int. Cl.[4] B64C 1/22
U.S. Cl. 244—118.2 **9 Claims**



1. In a transport aircraft having a tail-end door and a body comprising spaced transverse structural frames joined together longitudinally, said tail-end door being hinged on said body at the lower part of one of said structural frames defining a loading-unloading section of said transport aircraft, said one structural frame comprising an annular underframe, of which an upper part is reinforced by at least one structural girder subtending said upper part of said underframe,

an improvement for temporarily increasing the effective size of said loading-unloading section comprising a removable fixture adapted to be temporarily fixed on said upper part of said one structural frame in place of said structural girder, said fixture mechanically replacing said structural girder during loading-unloading operations and providing an enlargement for said loading-unloading section.

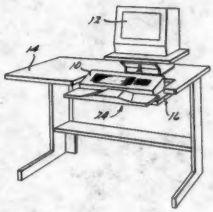
4,621,781

ERGONOMIC FOREARM REST FOR USE WITH KEYBOARDS

Timothy J. Springer, St. Charles, Ill., assignor to Marvel Metal Products Co., Chicago, Ill.

Filed May 16, 1985, Ser. No. 734,489
Int. Cl.[4] A47F 7/100
U.S. Cl. 248—118 **12 Claims**

1. An ergonomic forearm rest for supporting the forearms of workers engaged in keying tasks to alleviate tension and stress in the upper arms and shoulders comprising a support means adapted to be attached to a work surface for supporting a keyboard, and cushion means for supporting the forearms of workers using the keyboard, means for adjusting the position of the cushion means relative to the work surface and the keyboard, means for tiltably securing said cushion means to said support means including spring-loaded hinge means normally maintaining said cushion means in a horizontal position, the upper surface of said cushion means having a raised center plateau and two outer, lower side sections each connected to



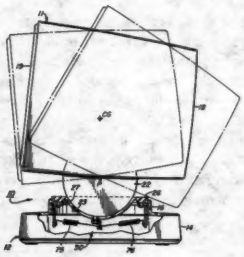
the center plateau by a sloping side section, the upper surface of each sloping side section beginning at either side of the raised cneter plateau and extending forward with respect to the support means at an outward angle to the centerline of the cushion means.

4,621,782

ARRANGEMENT FOR MOUNTING APPARATUS

Richard L. Carlson, Plano, and William J. Proetta, Elburn, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 26, 1984, Ser. No. 634,601
Int. Cl.[4] F16M 11/12
U.S. Cl. 248—183 **21 Claims**



1. An adjustable display monitor, comprising:

a superstructure, mounted to be adjusted about a neutral tilt position such that gravitational forces tend to pull said superstructure further from said neutral position when said superstructure is displaced therefrom, having a first curved continuous frictional bearing surface defined by a portion of a cylinder;

a base having a second curved frictional bearing surface frictionally and slidingly engaged with and matching said first surface, a frictional force being produced between said two surfaces; and

spring means attached to said superstructure and said base to exert a force in either of two opposite directions on said superstructure tending to restore said superstructure to said neutral tilt position when said superstructure is moved from said neutral tilt position in either of two opposite directions;

said frictional force and said spring force being sufficient to counterbalance said gravitational forces and maintain said superstructure in any position.

4,621,783

FASTENING AND A FASTENER MEMBER

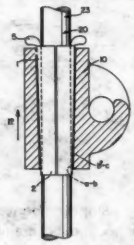
Jan H. Wier, Burleigh, Bulls, New Zealand

Filed Apr. 3, 1984, Ser. No. 596,400

Claims priority, application New Zealand, Apr. 11, 1983, 203841; Jun. 15, 1983, 204602

Int. Cl.[4] A47G *29/02*

U.S. Cl. 248—245 **10 Claims**



1. A fastener comprising: a first, inner sleeve of plastics material having a body and apices, and including a bore through its longitudinal axis of a substantially annular cross-section corresponding to an outer surface of an elongate member upon which the fastener member is to be located, said body of said first, inner sleeve member having a relatively thin wall, and an outer surface of said inner sleeve being tapered throughout its axial length at an angle relative to a longitudinal axis of said inner sleeve; said body having at least one longitudinal slit through said wall and extending substantially along the axial length of said inner sleeve; and a second, outer sleeve having a longitudinal axis and an inner surface, and its longitudinal axis, said inner surface having a taper substantially complementary to that of said outer surface of said inner sleeve; and wherein the ratio of the co-efficient of friction between the elongate member and the inner surface of said inner sleeve at least slightly exceeds the co-efficient of friction between said outer surface of said inner sleeve and said inner surface of said outer sleeve; said inner sleeve being positionable on said elongate member and said outer sleeve being positionable over by movement in a direction opposite to said apices of of said inner sleeve so that said inner sleeve and said outer sleeve are respectively wedged into frictional engagement and location on the elongate member and said inner sleeve.

4,621,784

INSTALLATION FOR THE LONGITUDINAL ADJUSTMENT OF A SEAT

Heinz Kaesling, Grub a. Forst; Emil Dinkel, Coburg, and Bernd Mann, Pfarrweisach, all of Fed. Rep. of Germany, assignors to Brose Fahrzeugteile GmbH & Co. KG, Coburg, Fed. Rep. of Germany

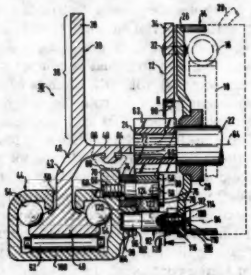
Filed Feb. 26, 1985, Ser. No. 705,794

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409582

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—430 **20 Claims**

1. An installation for the longitudinal adjustment of a seat, comprising at least a top rail means adapted to support the seat, said top rail means being form-lockingly and longitudinally displaceably guided in a coordinated bottom rail means, and dirve means operatively connected with one of the coordinated rail means, said drive means including a drive pinion which engages in a toothed rack mounted at the other rail means and exetnding along the same, the top rail means being made in one piece and including a base bar form-lockingly engaging into the bottom rail means, and said base bar starting



from an essentially U-shaped main profile section of the top rail means having upwardly projecting side legs.

4,621,785

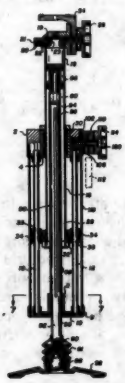
CAMERA MOUNT

Maurice C. Embra, Vancouver, Canada, assignor to Embra Productions Ltd., Vancouver, Canada

Filed Nov. 23, 1984, Ser. No. 674,280

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—565 **23 Claims**



1. A mount comprising:

(a) a frame having two transversely spaced elongated guides positioned thereon, and extending in the same direction;

(b) a support tube extending in the same direction as said guides;

(c) a platform attached to an upper end of said support tube;

(d) a bracket connecting an end of said support tube to said guides so that said support tube and attached platform, can slide in relation to the guides while being prevented from moving laterally with respect thereto;

(e) resilient means connected between said support tube and said frame, for inhibiting downward movement of said support tube and attached platform;

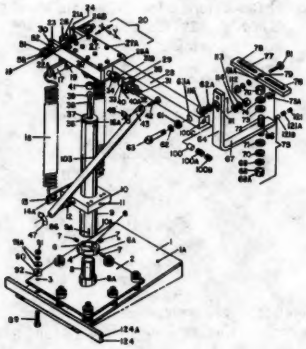
wherein said frame has an upper and a lower end, the guides are substantially parallel and extend therebetween, said support tube has a lower end fixedly connected to said bracket, and wherein said bracket has two mounts which slideably engage respective guides while preventing rotation of said bracket.

4,621,786

CAMERA MOUNT AND PHOTOGRAPHERS SEAT

Wilfred E. Greenlee, 861 Thruston Ave., Louisville, Ky. 40217

Filed May 17, 1982, Ser. No. 378,747
Int. Cl.[4] G03B 39/00
U.S. Cl. 354—74 17 Claims



1. A universal mount for aiming an instrument at a target comprising:

(a) a base;

(b) an upstanding support means;

(c) a fulcrum means located atop said support means;

(d) arm means extending outwardly from said support means having a seat means to pivotably receive said fulcrum means said arm means further having a first end and a second end and guide means having a guide aperture where said guide means extends outwardly from said arm means;

(e) bracket means to be slidably received on said arm means including a pair of spaced apart first bracket means extending generally parallel to said arm means on opposite sides of said support and extending outwardly from said first end of said arm means and having first aperture means where said first aperture means are in aligned relation along an axis generally transverse to the longitudinal axis of said support means and located outwardly said first end of said arm means;

(f) first shaft means to be slidably received in said first aperture of said first bracket means and first shaft stop means to fix said first shaft means with respect to said first bracket means;

(g) a pair of pivotable connector means connected to said first shaft means a selected distance from the longitudinal axis of said support means means;

(h) first and second tension bias means each to provide a line of force and connected to said connector means in spaced apart relation to urge said shaft means toward said base means along generally parallel lines of force;

(i) second shaft means carried by said bracket means and extending generally parallel to said arm means in space d relation therefrom and slidably received by said guide aperture, and stop means to selectively position said second shaft means in said guide means aperture; and

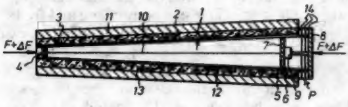
(j) instrument bracket means to be carried at said second end of said arm means t receive said instrument and suspend said instrument to a side of said arm means opposite said first side.

4,621,787

PRESTRESSABLE PASSAGE CORE

Knut S. Westberg, Mt. Pleasant, Australia, assignor to A-Betong AB, Sweden

Filed May 3, 1984, Ser. No. 606,748
Claims priority, application Sweden, May 6, 1983, 8302598
Int. Cl.[4] B28B 7/30
U.S. Cl. 249—63 4 Claims



1. An elongate core for providing passages (12) in a body (13) of castable material, which is to be cast in an outer mould (11), comprising:

an elongate core provided with anchoring means (4,6) at opposing ends of said core;

at least one tensioning member (10) extending between said anchoring means for prestressing the core (1) prior to casting; and

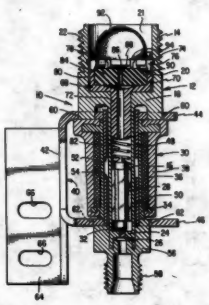
means for disengaging the core (1) from a finished body cast from said material and for relieving the prestress against said body (13) or the outer mould (11), said core disengaging and prestress relieving means including an abutment (8) movable longitudinally relative to said core and engageable with said body or the outer mould.

4,621,788

SOLENOID VALVE

Charles A. DeLew, Des Plaines, and Edwin A. Ostrowski, Mt. Prospect, both of Ill., assignors to Controls Company of America, Schiller Park, Ill.

Filed Aug. 7, 1985, Ser. No. 763,369
Int. Cl.[4] F16K 31/06, 47/08
U.S. Cl. 251—120 5 Claims



1. A solenoid valve comprising:

a molded one-piece valve body, said body including a relatively large diameter cup-shaped housing having an annular side wall, a back wall, and an open inlet mouth for admitting liquid into the housing interior, said body also including a relatively small diameter elongated tubular extension formed integrally with and projecting outwardly from the housing back wall on the housing axis for receiving liquid from the housing interior, said body also including a single annular valve seat formed within the tubular extension as an integral part thereof, said valve seat being formed as an inwardly radiating flange adjacent the end of the tubular extension remote from the cup-shaped housing;

a movable valve element cooperable with said valve seat to control liquid flow through the tubular extension, said valve element comprising an elongated armature plunger slidably positioned within the tubular extension in the space between the cup-shaped housing and the valve seat, said armature plunger being cross-sectioned to permit liquid to pass from the housing through the valve seat when the armature is axially spaced from the valve seat;

a solenoid coil magnetic frame assembly telescoped onto the tubular extension in the area thereof between the housing and the valve seat, said frame comprising a U-frame member having a web wall paralleling the tubular extension and two flanges lying against the ends of the coil, said frame further comprising magnetically permeable sleeves extending axially from the frame member flanges into the coil in surrounding relation to the tubular extension, said sleeves terminating short of one another to define a centering gap to be bridged by the armature when the coil is energized, said armature being dimensioned so that movement thereof to a position bridging the magnetic gap causes said armature to open the flow path through the valve seat; and

a resilient deformable flow rate control member disposed within the cup-shaped housing to regulate the liquid flow therethrough;

wherein the improvement comprises:

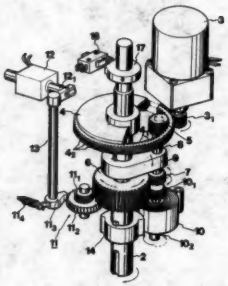
a molded plastic insert disposed within the cup-shaped housing, the insert having a cup-shaped portion and a tubular extension, the cup-shaped portion adapted to contain the flow rate control member and the tubular extension of said insert extending into the tubular extension of said valve body a sufficient distance to limit the travel of said armature plunger so that said plunger does not pass said centering gap when the coil is energized.

4,621,789

ELECTRICALLY DRIVEN VALVE

Rikuo Fukamachi, 1-44-10, 1-chome, Tezukayama, Nara City, Japan

Filed Nov. 4, 1985, Ser. No. 794,373
Int. Cl.[4] F16K *31/04*
U.S. Cl. 251—129.12 **1 Claim**



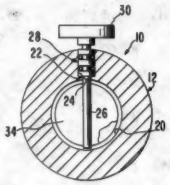
1. In an electrically driven valve arranged to selectively open or close a valve **1** by rotating an output shaft **2** connected to a rotary shaft of a valve body of said valve **1** through 90° in a forward or reverse direction based on driving by a reversible motor **3**, the improvement comprising an internal gear **4** rotatably provided on said output shaft **2** for rotation independently of the output shaft **2** through rotation of the motor **3**, a gear **5** in mesh with inner peripheral teeth 4_1 . . . 4_1 of said internal gear **4** and a gear **6** rotatably supported by said output shaft **2** and arranged to be rotated independently of said output shaft, a shaft **8** having said gears **5** and **7** fixed at opposite ends thereof, a crank **9** integrally fixed to said output shaft **2**, said shaft **8** being rotatably extended through a bore **9** formed at part of said crank **9**, a spiral spring **10** adapted to be wound through rotation of said gear **6** in one direction, a ratchet mechanism **11** for preventing said spiral spring from reverse rotation, and a solenoid **12** for releasing the stopping function of said ratchet mechanism.

4,621,790

BUTTERFLY VALVE

Valentin Balter, San Francisco, Calif., assignor to Huntington Mechanical Laboratories, Inc., Mountain View, Calif.

Filed May 29, 1984, Ser. No. 614,495
Int. Cl.[4] F16K *1/22*
U.S. Cl. 251—305 **13 Claims**



13. A butterfly valve comprising:

a valve body having a surface defining a fluid passage therethrough;

a hole in the valve body on one side of the passage and communicating with the passage;

a shaft extending through the hole and into the valve body, said valve body having a curved groove extending circumferentially of and into the surface of the passage, said groove being aligned with the hole, one end of the shaft extending into the groove, the circumferential length of the groove being greater than the diameter of the shaft and the axial length of the groove being substantially the same as the diameter of the shaft; and

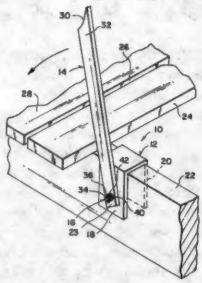
a valve member on the shaft, the opposite end of the shaft extending outwardly from the valve body through said hole, whereby the shaft can be manually rotated to cause the valve member to be moved into and out of closing relationship to the passage.

4,621,791

BOARD STRAIGHTENER

Vincent P. Staskiewicz, and George Spector, both of 233 Broadway Rm 3615, New York, N.Y. 10007

Filed Jun. 17, 1985, Ser. No. 745,535
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—17 **2 Claims**



1. A board straightener tool which comprises:

(a) a U-shaped saddle having two spaced apart arms so that said saddle can be placed on a joist;

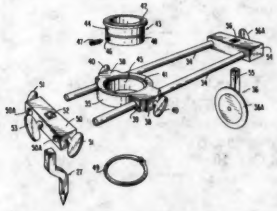
(b) a hand lever; and
(c) a pivotal connection between bottom end of said hand lever and one of said arms of said saddle so that said hand lever can come into contact with a board on top of said joist and by using leverage move said board to decrease size of a gap between said board and another board for constructing decks, wherein said hand lever includes a pry bar at top end so that when said hand lever is removed from said pivotal connection said pry bar can be used to increase size of said gap between said boards, wherein said pivotal connection comprises:
(d) a shaft mounted transversely to said arm of said saddle, said shaft having a transverse aperture at free end;
(e) said hand lever having a hole at said bottom end so that said hand lever can pivot about said shaft;
(f) a washer placed on said shaft; and
(g) a clevis pin placed through said transverse aperture at said free end of said shaft to hold said washer and said hand lever thereto, wherein said shaft is mounted at an obtuse angle to said arm of said saddle so that when said hand lever comes into contact with said board said saddle will twist to make better contact with said joist.

4,621,792

CUTTING TOOL ATTACHMENT

Antony N. Thurston, 11 Para Street, Balwyn, Victoria 3103, Australia

PCT No. PCT/AU83/00155, § 371 Date Jun. 26, 1985, § 102(e) Date Jun. 26, 1985, PCT Pub. No. WO85/01903, PCT Pub. Date May 9, 1985
PCT Filed Oct. 26, 1983, Ser. No. 757,837
Int. Cl.[4] B23K *7/10*
U.S. Cl. 266—70 **9 Claims**



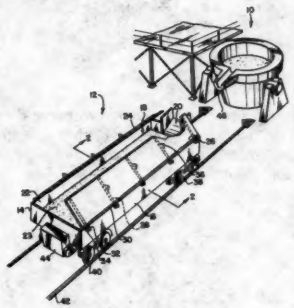
1. An attachment for a cutting torch to permit cutting of circular holes from metal sheet, comprising a mounting frame comprising a pair of spaced parallel guide rods, a support member for pivotally supporting a cutting head of the torch, said support member extending transversely between the guide rods and being mounted for sliding movement along the guide rods, first and second mounting means each extending between the guide rods, said first mounting means being mounted for sliding movement along the guide rods, and said support member and said first mounting means being removable from the guide rods whereby the support member and said first mounting means may be interchanged in position on the guide rods, pivot means for supporting the frame for movement about an axis, the guide means for supporting the frame during such movement whereby the head is carried at a suitable height, said guide means being removably mountable on one of said mounting means, and said pivot means being removably mountable on the other of said mounting means.

4,621,793

SUPERHEATED MATERIAL COOLING CAR WITH HEAT DEFLECTORS THAT RESTRICT SIDEWAYS RADIATION

Robert Thiel, and Edward Bielawski, both of P.O. Box 2163, Niagara Falls, Ontario, Canada L2E 6Z3

Filed Sep. 13, 1982, Ser. No. 417,263
Int. Cl.[4] B61D *3/16, 5/00, 17/18;* **C21B** *3/10*
U.S. Cl. 266—165 **10 Claims**



1. A cooling car for use in removing super-heated molten materials from a melting furnace, comprising:
a metal frame including a container with an open top for receiving the molten materials said container having a surface area of at least 10 times its average depth;
a relatively permanent refractory lining protecting the interior surface of the container;
heat deflector means secured to the metal frame and extending generally upwardly about the top of the container for permitting substantial radiation of heat upwardly from molten materials received in the container while restricting radiation of heat adjacent to the side of said cooling car; and
wheels secured to the metal frame to permit the metal frame to be rolled.

6. In combination with a melting furnace which produces super-heated molten materials, a system for use in removing the molten materials comprising:
a substantially horizontal track extending from adjacent the furnace away from the furnace; and
a cooling car having the structure of claim 1, said wheels adapted to permit said cooling car to roll along said track.

4,621,794

APPARATUS FOR PRODUCING A GRAIN-ORIENTED ELECTROMAGNETIC STEEL STRIP OR SHEET

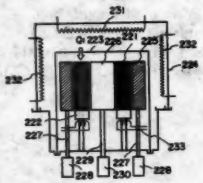
Katsuaki Kokai, and Takeo Ohta, both of Kitakyusyushi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 435,457, Oct. 4, 1982, Pat. No. 4,500,366.
This application Aug. 1, 1984, Ser. No. 636,662
Int. Cl.[4] C21D *9/663*
U.S. Cl. 266—256 **3 Claims**

1. An apparatus for heat treating a coil of a grain-oriented electromagnetic steel strip, comprising:
a base plate on which the coil is to be positioned;
an annular insulator for surrounding the outer peripheral surface of the coil in slightly spaced apart relation therefrom;
a cylindrical insulator for positioning within the coil in slightly spaced apart relation from the inner peripheral surface of the coil;
means provided below said base plate for moving the coil or said annular and cylindrical insulators vertically;
an inner cover for surrounding the coil and said base plate;
an outer cover surrounding said inner cover;

heating means for heating the coil; and

means for cooling the lower end of the coil during its heat treatment;



said moving means being adapted to move the coil or said insulators vertically so that a temperature gradient of at least 2° C./cm may be established along the height of the coil being heat treated.

4,621,795

HYDRAULICALLY DAMPED RESILIENT MOUNTING

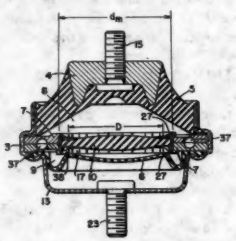
Günter Eberhard, Gehrden; Jürgen Heitzig, and Werner Fischer, both of Hanover, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,089

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407553

Int. Cl.[4] F16F *9/10, 9/34*

U.S. Cl. 267—8 R **6 Claims**



1. A hydraulically damped, resilient mounting particularly for a drive motor of a motor vehicle and having a housing which is covered by elastomeric spring means having an effective area thereof determined by an effective diameter of said spring means, and which is divided by a rigid partition into two chambers; said chambers of said housing being filled with a damping fluid, and said chambers being adapted so that they can alternately have a change in their volume; said partition being provided with a flexible diaphragm which is axially movable to a limited extent in a central opening of said partition with a predetermined size of a smallest passage area of the opening correspondingly located as to the effective area of said spring means; said diaphragm defining a narrow by-pass between said chambers for said damping fluid; the improvement therewith wherein:

said partition has a radially inner edge which forms said opening thereof; said radially inner edge being provided with indentations which overlap a radially outer bead edge of said diaphragm, and which are distributed equidistantly over the periphery of said inner edge of said opening.

4,621,796

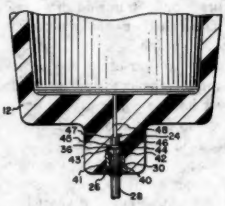
AIRSPRING WITH PNEUMATIC FITTING

Henry D. Fresch, Silver Lake, and Steven E. Hurt, N. Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 9, 1984, Ser. No. 659,107

Int. Cl.[4] F16F *9/04*

U.S. Cl. 267—64.28 **2 Claims**



1. An airspring having at least one plastic rigid member comprising:

an upper retainer;

a lower retainer spaced apart from the upper retainer;

a flexible gas impervious membrane sealably attached to said upper and lower retainers to form a cavity therebetween wherein at least one of said retainers is made of plastic and includes an orifice therethrough in connection with the cavity, said orifice having first, second, third, fourth and fifth concentric bores;

a coupling comprising an annular sleeve including a plurality of jaws adapted for receiving a fluid conduit therein being positioned in said orifice, a ring having a flared portion for forcing the jaws of the annular sleeve radially inward into engagement with the fluid conduit surrounding said sleeve, said ring including a flange having a diameter equal to said first bore, said ring being retained in said first and second bores, an o-ring being positioned axially inward of said ring within said third bore, to form a seal between the fluid conduit and the orifice and said fluid conduit being positioned within said fourth bore and said fifth bore connecting with said cavity.

4,621,797

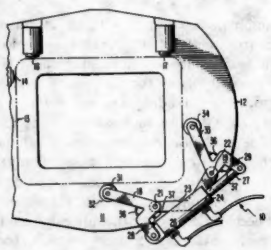
DEVICE FOR ORIENTING AN OBJECT ON A FLAT SURFACE

Edward T. Ziegenfuss, East Petersburg, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 10, 1985, Ser. No. 785,995

Int. Cl.[4] B23Q *3/08*

U.S. Cl. 269—34 **9 Claims**



1. A device for orienting an object on a flat support surface comprising:

first lever means having a first orienting end and a first actuated end, said first lever means being pivotably cou-

pled to said flat support surface at a first pivot point between said first orienting end and said first actuated end;

second lever means having a second orienting end and a second actuated end, said second lever means being pivotably coupled to said flat support surface at a second pivot point between said second orienting end and said second actuated end, said first and second pivot points being located to span said object;

actuating means supported by and pivotably coupled to said first and second actuated ends, at least one of said lever means being configured to include opposite facing angles to provide clearance between said at least one lever and said actuating means, whereby energization of said actuating means pivots said first and second levers and said first and second orienting ends urge any object on said support surface into a desired orientation and location.

4,621,798

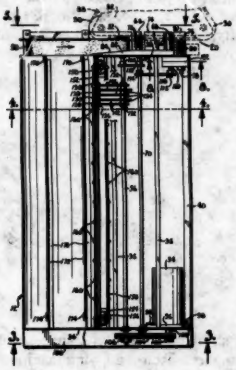
ENVELOPE FEEDING MECHANISM FOR MAIL SORTING MACHINES

Roy Akers, Olathe, Kans., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 11, 1984, Ser. No. 609,544

Int. Cl.[4] B65H 5/02

U.S. Cl. 271—5 **7 Claims**



1. In a mail sorting machine having a magazine section for receiving a supply of envelopes to be sorted, pickoff means for picking off the individual envelopes one at a time from the envelope supply, and means for sorting and depositing the envelopes in a storage area of the machine, the improvement comprising:

first conveyor means on said magazine section of the machine for receiving the supply of envelopes with the envelopes occupying substantially parallel vertical planes and conveying the envelope supply in a direction generally perpendicular to said vertical planes at a first speed, said first conveyor means having an input end for receiving the envelope supply and a discharge end for discharging the envelopes from said first conveyor means;

second conveyor means adjacent said discharge end of the first conveyor means for receiving the envelopes discharged therefrom and conveying the envelopes in a direction generally parallel to said vertical planes at a second speed higher than said first speed, whereby the envelopes on the second conveyor means tend to spread out from their condition on said first conveyor means;

a first grooved roller having a spiral groove thereon extending about the longitudinal axis of the roller, said groove having a size to receive the lower edge of an envelope discharged from said second conveyor means;

means for mounting said first roller for rotation about said axis with said axis oriented substantially perpendicular to the direction of movement of the envelope on said second conveyor means;

a second grooved roller having a spiral groove extending about the longitudinal axis of the second roller, said groove of the second roller having a size to receive a leading side edge of an envelope;

means for mounting said second roller for rotation about its axis at a location offset from and elevated relative to said first roller to accept in the groove of the second roller the side edge of an envelope having its lower edge in the groove of the first roller, thereby maintaining the envelope in a position to occupy a substantially vertical plane; and

drive means for rotating said first and second rollers about their axes to deliver the envelopes one at a time from said second conveyor means to said pickoff means of the mail sorting machine.

4,621,799

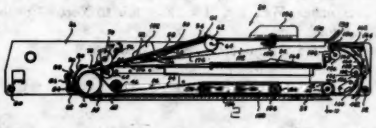
AUTOMATIC DOCUMENT FEEDER AND REGISTRATION SYSTEM THEREFOR

Francis M. Bastow, Valley, and William C. Hoffman, Apalachin, both of N.Y., assignors to Savin Corporation, Stamford, Conn.

Filed Dec. 13, 1982, Ser. No. 449,132

Int. Cl.[4] B65H 5/06

U.S. Cl. 271—10 **4 Claims**



1. Apparatus for feeding documents to the exposure platen of an electrophotographic copier including in combination a belt having a portion overlying said exposure platen and a portion remote from said exposure platen, a roller disposed adjacent said remote belt portion, said roller and said belt forming a nip, means for supporting a stack of documents at a location spaced from said nip, means for advancing a document from said stack into said nip, first actuating means for successively actuating said belt to advance a document from said nip to said platen, and second actuating means operable before each such actuation of said belt for actuating said advancing means to advance a document from said stack to said nip.

4,621,800

ARRANGEMENT FOR AND METHOD OF TRANSFERRING FILM

Walter Bauer; Heinrich Färber, both of Munich, and Rudolf Schneider, Pfaffenhofen/Ilm, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,740

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248458

Int. Cl.[4] B65H 5/08

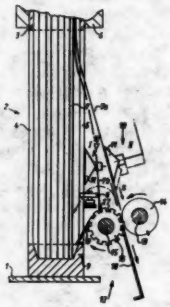
U.S. Cl. 271—11 **26 Claims**

24. A method of transferring sheet-like articles, particularly films, having different widths, comprising the steps of:

(a) transporting one of said articles from a first location to a second location, said one article including first and second portions which are disposed next to one another as considered along the width of said one article, and said first portion having a width no greater than that of the narrowest of said articles, the transporting step comprising applying a gripping force only to said first portion of said one article; and

(b) conveying said one article away from said second loca-

tion along a predetermined direction transverse to the width of said one article, the conveying step including applying a first conveying force smaller than said gripping



force to said first portion of said one article and a second conveying force smaller than said first conveying force to said second portion of said one article.

4,621,801

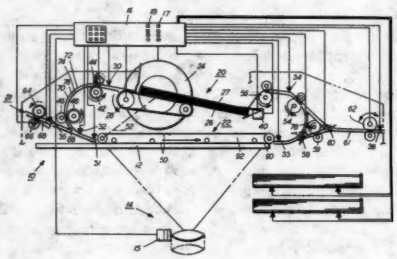
DOCUMENT EDGE REGISTRATION SYSTEM

Hector J. Sanchez, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 6, 1984, Ser. No. 678,859

Int. Cl.[4] B65H *9/16*

U.S. Cl. 271—251 **6 Claims**



1. In a document feeder for feeding a thin, flimsy, document sheet in a document feeding path downstream to a registered copying position on the platen of a copier, with document deskewing and document lateral edge registration transverse the direction of the document feeding path to the platen and upstream of the platen with skewed roller edge registration means for feeding the document both transversely and downstream, and wherein large radius non-skewed arcuate document guide path means provide arcuate document deforming in the direction of said document feeding path to the platen and document inverting, the improvement wherein:

arcuate document edge confinement and control means are provided along one lateral edge of said arcuate document guide path means,

said skewed roller edge registration means is mounted in and intermediately of said arcuate document guide path means for providing both lateral edge registration and deskewing of a document therein by transverse movement of the document into alignment with said document edge confinement and control means while the document is arcuately deformed in both said arcuate document guide path means and said document edge confinement and control means,

and document feeding means are provided for feeding the document into said arcuate document guide path means and into said skewed roller edge registration means, said document feeding means includes means for releasing the document for preventing interference with said transverse movement of the document by said skewed roller edge registration means,

wherein said arcuate document edge confinement and control means comprises a document edge guide having a narrow arcuate slot having a smooth bottom extending along said lateral edge and correspondingly arcuately to said arcuate document deforming, said arcuate slot being adapted to receive, confine closely and uniformly arcuately, and edge register therein, along said bottom of said slot, said one lateral edge of the document, and wherein said skewed roller edge registration means is positioned closely adjacent said slot bottom and adapted to laterally feed said one lateral edge of the document transversely fully into said slot while also feeding the document downstream arcuately in said slot slidably along said slot bottom for said document lateral edge registration and deskewing.

4,621,802

SHEET MATERIAL CONVEYING DEVICE

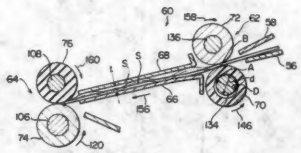
Hiroshi Ishida, Ikoma; Junichi Hirobe, Osaka; Toshikazu Tomi, Osaka, and Masami Taniguchi, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 12, 1984, Ser. No. 631,171

Claims priority, application Japan, Jul. 19, 1983, 58-112047[U]

Int. Cl.[4] B65H *5/06*

U.S. Cl. 271—272 **9 Claims**



1. In a paper sheet material conveying device for feeding paper sheets in an electrostatic copying machine, said conveying device being of the type comprising a feed roller assembly for feeding the paper sheets in a feed direction and temporary hampering means, located downstream of said feed roller assembly with respect to said feed direction, for temporarily stopping forward movement of a paper sheet being fed by said feed roller assembly, said feed roller assembly comprising a driven shaft, means for continuously rotating said driven shaft, at least one driven roller mounted on said driven shaft, a follower shaft spaced from said driven shaft, and at least one follower roller mounted on said follower shaft, said driven roller and said follower roller rotating and nipping therebetween a paper sheet during feeding thereof by said feed roller assembly, and the paper sheet, upon being stopped temporarily by said hampering means, preventing rotation of said follower roller, the improvement comprising means for, upon the paper sheet being stopped by said hampering means, preventing soiling of the paper sheet without interruption of the continuous rotation of said driven shaft, said preventing means comprising:

at least two pairs of driven rollers mounted on said driven shaft and including a first pair of driven rollers positioned relatively adjacent each other axially centrally of said driven shaft and a second pair of driven rollers spaced from each other on opposite axial sides of said first pair of driven rollers;

each said driven roller having an inner diameter greater than the outer diameter of said driven shaft, with each said

driven roller mounted on said driven shaft for free rotation relative thereof;

restraining means on said driven shaft for preventing movement of said driven rollers axially of said driven shaft;

said first pair of driven rollers having a first width in the axial direction of said driven shaft corresponding to the width of a first size paper sheet, and said first and second pairs of driven rollers having a combined second width in said axial direction corresponding to the width of a second size paper sheet;

said follower roller urging said driven rollers against said driven shaft to generate therebetween a first friction force sufficient to transmit rotation of said driven shaft to said driven rollers during feeding of the paper sheet; and

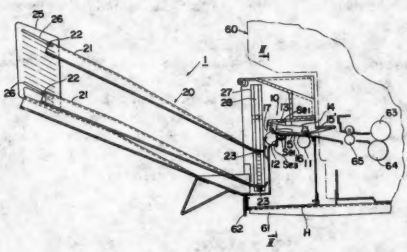
stopping the paper sheet by said hampering means generating between the paper sheet and the respective said driven rollers corresponding to the respective width of the paper sheet a second friction force greater than said first friction force, thereby stopping rotation of said respective driven rollers during continued rotation of said driven shaft.

4,621,803

SORTING APPARATUS OF SHIFTABLE BIN TYPE

Akiyoshi Johdai, and Takuma Ishikawa, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 2, 1985, Ser. No. 783,022
Claims priority, application Japan, Oct. 4, 1984, 59-209142
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—293 **26 Claims**



1. A sorting apparatus of a shiftable bin type which has a plurality of bins which successively receive copy paper sheets from a sheet outlet of a transport section for sorting thereof, inlet ends of said bins being so arranged as to move progressively past the sheet outlet in opposite directions, and a bin shifting means for shifting the respective bins so that said bins are located close together when positioned at either side of said sheet outlet, but is largely spaced from the bin located immediately thereabove when positioned to accommodate the incoming sheet from said sheet outlet, said sorting apparatus comprising:

a first detecting means for detecting presence or absence of copy paper sheets on said bins to emit a signal, and

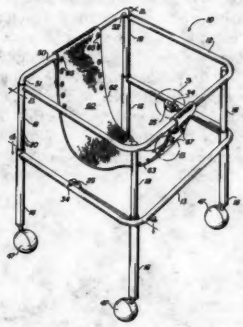
a control means for controlling said bin shifting means in such a manner that, after completion of sorting, upon detection by said first detecting means that the copy paper sheet has been removed from the bin confronting said sheet outlet, said bin shifting means moves the subsequent bin containing the copy paper sheet to the position confronting said sheet outlet in response to the signal of said first detecting means.

4,621,804

THERAPEUTIC ROLLER/WALKER

Robin R. Mueller, Scottsdale, Ariz., assignor to R-Jayco Ltd., Scottsdale, Ariz.

Filed Mar. 25, 1985, Ser. No. 715,910
Int. Cl.[4] A47D *13/04*
U.S. Cl. 272—70.3 **23 Claims**



1. A therapeutic walker particularly suitable for use by persons with varying degrees of disability during the progress of rehabilitation including in combination:

a frame extending around at least three sides of a region occupied by a person using the walker, said frame functioning as hand rails for such person;

a closure bar movably attached to said frame to selectively close the fourth side of the region occupied by a person using the walker;

an elongated crotch-cradling panel of flexible material, attached between opposite sides of said frame to be draped in a generally U-shaped configuration and adapted to pass entirely between the legs of a person using said walker, said panel being removably attached at at least one end thereof, said crotch-cradling panel functioning as a seat located substantially in the center of the region within said frame; and

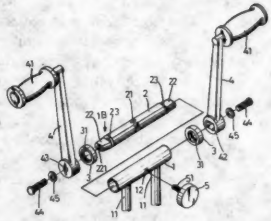
a plurality of legs attached at spaced locations to said frame and extending downwardly therefrom for supporting said frame on the surface on which the walker is used.

4,621,805

HANDLE STRUCTURE FOR AN EXERCYCLE

Yi S. Chen, No. 36, Alley 23, Lane 493, Sec. 3, Chung Shan Rd., Tan Tzu Hsiang, Taichung Hsien, Taiwan

Filed Jul. 29, 1985, Ser. No. 759,678
Int. Cl.[4] A63B *21/00*; B62K *21/16*
U.S. Cl. 272—73 **1 Claim**



1. An improved handle structure for an exercycle of the type including a saddle seat and front support means for supporting a pair of handlebars, which structure comprises:

(a) a cylindrical tube carried by the front support means;

(b) an angle-adjusting rod provided with a plurality of holes spaced around the central region thereof, with each end of the rod including a fixing block and a fixing slot disposed between the rod and the fixing block, the rod being receivable within the cylindrical tube;

(c) a pair of fixing rings, each ring being engageable within a corresponding fixing slot of the angle-adjusting rod when the rod is disposed within the cylindrical tube;

(d) a pair of handle rods, each handle rod including a handlebar at one end and a handle slot at the other end, configured for receiving a corresponding fixing block; and

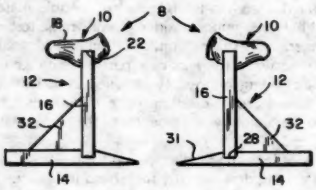
(e) a locking bolt for passing through the cylindrical tube for selectively engaging any one of the holes in the angle-adjusting rod for securing the angle-adjusting rod relative to the tube, thereby permitting the handlebars to be selectively disposed in any one of plural different height positions.

4,621,806

THERAPEUTIC APPARATUS

William K. Wheeler, Amherst, N.H., assignor to W. K. Wheeler, Inc., Amherst, N.H.

Filed Feb. 11, 1985, Ser. No. 700,554
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—93 **6 Claims**



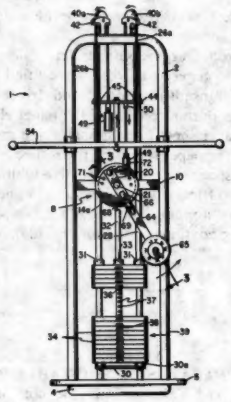
1. Apparatus comprising a pair of hand-supporting structures, each having upwardly-facing rigid surfaces corresponding in surface contour to substantially the palmar surface of the hand, each structure embodying an outboard side about which the fingers can be curled and means supporting the hand-supporting structure in stable equilibrium at a height such as to enable one to support himself in a generally prone position between a pair of said hand-supporting surfaces with his hands engaged with the upwardly-facing surface thereof and with his fingers curled about the outboard sides to perform pushups therebetween, said means comprising a rectangular baseboard containing in its top side a groove parallel to two of its sides, said baseboard at one side of the groove being wider than the other side and said baseboard at the other side tapering from a thickness adjacent the groove corresponding to the thickness of the baseboard at said one side to an aborted feather edge, a support structure of generally trapezoidal configuration disposed with its lower edge in the groove in the baseboard and its upper edge disposed in a groove at the underside of the hand supporting structure disposed longitudinally of the hand supporting structure, said hand supporting structure being disposed with its outboard side overlying the said one side and a triangular brace disposed at said one side of said support structure with one right side fixed to said support structure and the other right side fixed to said baseboard.

4,621,807

LEG AND HIP EXERCISING APPARATUS

Raymond F. Stramer, Watkins, Iowa, assignor to Universal Gym Equipment, Inc., Cedar Rapids, Iowa

Filed May 25, 1984, Ser. No. 614,339
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **16 Claims**



1. An exercise machine comprising;

a frame;

a rotatable pulley means mounted to the frame;

cable means wound in opposite directions about the pulley means so that as the pulley means is rotated in either a clockwise or counter-clockwise direction said cable means is both unwound from and wound onto said pulley means;

weight resistive means;

means for interacting said cable means with said weight resistive means such that a resistive force can be provided when said pulley means is rotated in either a clockwise or counter-clockwise direction from an initial static position;

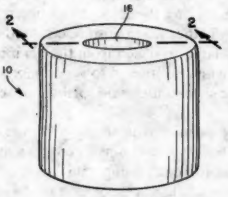
and means interacting with said pulley means for engagement by a user to apply a rotative force to the pulley means, to overcome the resistive force.

4,621,808

VISCO-ELASTIC WEIGHT

Lewis P. Orchard, and Judi K. Simon, both of McLennan County, Tex., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 2, 1985, Ser. No. 718,924
Int. Cl.[4] A63B *21/12*
U.S. Cl. 272—119 **5 Claims**



1. A visco-elastic weight comprising:

(a) a core of weighted visco-elastic material comprising:

(i) a particulate weight-adding agent substantially homogeneously dispersed within a visco-elastic material; and

(b) a covering surrounding the core wherein said core has a

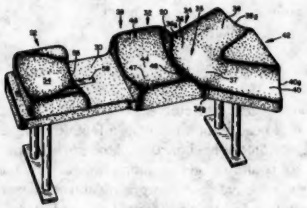
generally annular shape and the weighted visco-elastic material and covering are capable of elastic stretching to the extent necessary for the weight to slip over a hand or foot and remain in place on an adjoining wrist or ankle during exercise movement.

4,621,809

BENCH CONSTRUCTION FOR USE IN WEIGHT LIFTING

William A. Pearl, 178 Hummingbird La., Talent, Oreg. 97540

Filed Oct. 11, 1983, Ser. No. 540,357
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 **12 Claims**



1. A weight-lifting bench for use by an individual lifter reclined thereon in performing weight lifting movements comprising:

an elongate bench top means for supporting the lifter's trunk and upper legs and support means supporting the bench top means in an elevated position above the floor whereby the lower legs of the lifter may drape to the floor;

said bench top means being contoured for engaging and stabilizing the lifter's trunk and upper legs and including a first, substantially planar section for engaging the lifter's scapulae, a lower-body section including a buttock support region and a pair of shallow channel-like leg-receiving depressions connecting with the buttock support region and extending therefrom in directions diverging from each other and laterally outwardly from the longitudinal axis of the bench top means, said leg-receiving depressions each having a concavity disposed transversely of the direction that the depression extends and being anatomically contoured for stabilizing the lifter's upper legs by engaging a major portion of each leg biceps so that each upper leg is predisposed in a predetermined outwardly diverging orientation, and an intermediate section disposed between the planar and lower-body sections defined by a bilateral support means for engaging and supporting the lifter's back and trunk beneath the Latissimus dorsi muscles, the intermediate section being elevated relative to the planar and lower-body sections.

4,621,810

WEIGHT LIFTING TYPE EXERCISING DEVICE

Joseph B. Cummins, 606 McAdoo, Clinton, Tenn. 37716

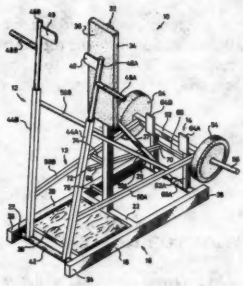
Filed Apr. 29, 1985, Ser. No. 728,310
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **14 Claims**

1. An exercise device for use by an operator in performing weight lifting exercises, said device being utilized in conjunction with at least one weight member, said device comprising:

a frame defining a forward end and a rearward end, said frame comprising a base portion and a substantially vertically oriented back support member mounted on said base portion of said frame intermediate said forward end and said rearward end for supporting the back of said operator during said exercise;

a lever assembly pivotally mounted on said frame proximate said forward end for movement by said operator during said exercise, said lever assembly comprising first and second cooperating lever arms each having a first end pivotally connected to said frame and a second end, each said lever arm being provided with at least one handle member for grasp by said operator to effect said movement of said lever assembly; and

a weight support assembly rigidly secured to and extending rearwardly from said lever assembly to proximate said rearward end of said frame, said support weight assembly comprising a pair of arms each having a first end attached



to a corresponding one of said lever arms, and second ends defining an outboard end portion for said weight support assembly, said outboard end portion provided with a weight bar for receiving said at least one weight member, said weight bar provided with opposite end portions extending from said weight support assembly for receiving said at least one weight member whereby gravity acting upon said weight member produces resistance to the selective pivoting of said lever assembly by said operator during said exercise.

4,621,811

BASKETBALL TRAINING DEVICE

John F. Campbell, 6030 Fairway La., Wescosville, Pa. 18106

Filed Mar. 27, 1986, Ser. No. 844,678
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—1.5 A **15 Claims**

1. A training device for development skills in the game of basketball or the like sport utilizing a hoop rim mounted on an elevated backboard above a playing surface, said device comprising:

(a) an angular rope support arm;

(b) means to attach said support arm's proximal end to a

hoop rim so that the support arm's distal end terminates above and proximate said hoop;

(c) rope of a predetermined length adapted to be slidably connected to said support arm so that one end of said rope contains sufficient length to project downward from said proximal end of said mounted support arm to allow a user to grasp said end while standing proximate a playing surface, the other rope end being of sufficient length to project downward from said distal end of said mounted support arm proximate and above said mounted hoop; and,

(d) means to attach said rope's said other end to a ball,

so that a ball's suspension from the rope proximate said hoop may be controlled by said user to permit players to increase their skills by jumping to grasp or move said ball.

4,621,812

INSTALLATION FOR THE TRANSPORT OF TENNIS BALLS

Werner Salansky, Vienna, Austria, assignor to Stabeg Apparatebaugesellschaft m.b.h., Vienna, Austria

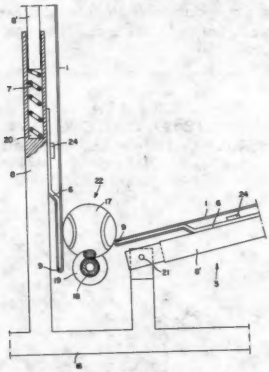
PCT No. PCT/AT84/00006, § 371 Date Oct. 12, 1984, § 102(e) Date Oct. 12, 1984, PCT Pub. No. WO84/03222, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 16, 1984, Ser. No. 673,759

Claims priority, application Austria, Feb. 23, 1983, 610/83

Int. Cl.[4] A63B *69/40*

U.S. Cl. 273—29 A **2 Claims**



1. A system for delivering tennis balls comprising an at least substantially vertical rebound wall, a collection trough for the balls disposed at the base of said wall, a ramp having an ascending portion extending from said trough and a descending portion leading from the upper end of said ascending portion to a playing area, said ramp being connected to said rebound wall by a support frame, both the rebound wall and the ramp having frames provided with a covering each of said frames being comprised of a pair of spaced apart substantially parallel side members and a pair of spaced apart substantially parallel edge rails defining a plane, said side members each being comprised of telescoping tubular members and said edge rails extending between and connecting the ends of said side members, said covering being secured only to said edge rails, each of said telescoping side members being longitudinally forced away from each other by the pressure of a spring means arranged therein to thereby tension said covering.

4,621,813

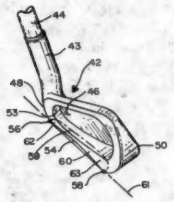
GOLF CLUB SET

Karsten Solheim, 501 Wakonda La., Phoenix, Ariz. 85023

Filed Oct. 15, 1984, Ser. No. 660,789

Int. Cl.[4] A63B *53/04*

U.S. Cl. 273—77 A **9 Claims**



1. An improved correlated set of iron-type golf clubs, each club having a head which includes a face for impacting a golf ball, a back surface, a heel portion, a toe portion and a sole, said sole having a trailing edge extending between said heel and toe portions, the improvement comprising at least a central portion of said trailing edge being indented toward said face at least 1/16 of an inch and having at least the lower portion of said back surface adjacent said indented trailing edge configured to conform to said indented trailing edge by sloping upwardly and inwardly from said indented trailing edge toward said face.

4,621,814

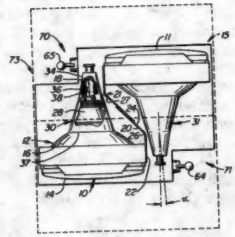
AMUSEMENT DEVICE HAVING JUXTAPOSED VIDEO DISPLAYS

Donald C. Stepan, Reno, Nev.; Dan J. Waller, Truckee, Calif., and J. George Drews, Reno, Nev., assignors to IGT, Reno, Nev.

Filed May 24, 1984, Ser. No. 614,401

Int. Cl.[4] H04N *5/64*; A63F *9/22*

U.S. Cl. 273—138 A **2 Claims**



1. A video amusement apparatus comprising:

first and second cathode ray tubes each forming part of an independent amusement device and each having a video screen;

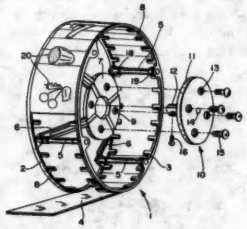
a housing including first and second oppositely oriented housing faces and mounting the cathode ray tubes so that the screens are located at the faces and are oriented in opposite directions, the housing defining first and second housing halves, each of which includes a housing face, wherein the housing halves are of substantially equal widths and are laterally offset so that a portion of each housing half extends laterally past a side of the other housing half to thereby define a recess adjacent each said side; and

means for operating each amusement device and positioned in the respective recesses.

4,621,815
REEL ASSEMBLY FOR SLOT MACHINES

Toshio Yamamoto, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Nov. 13, 1984, Ser. No. 670,997
Claims priority, application Japan, Nov. 14, 1983, 58-174764[U]
Int. Cl.[4] A63F 5/04
U.S. Cl. 273—143 R 10 Claims



1. A reel assembly for a slot machine which is adapted to be fixed on the drive shaft of an electric motor and has symbols disposed on the periphery thereof, comprising:

a cylindrical body having said symbols on the periphery thereof; and

means for releasably securing said cylindrical body to a said drive shaft of an electric motor;

said cylindrical body comprising two frames of ring shape, at least one of said frames having a plurality of hollow sleeves extending toward but terminating a substantial distance from the other said frame, and a plurality of connecting members secured to said other frame and extending toward said one frame and being secured to said sleeves.

4. A reel assembly for a slot machine which is adapted to be fixed on the drive shaft of an electric motor and has symbols disposed on the periphery thereof, comprising:

a cylindrical body;

means for releasably securing said cylindrical body to a said drive shaft of an electric motor;

said cylindrical body comprising two frames of ring shape;

each said frame having a plurality of tongues thereon extending toward the other frame but terminating substantially less than half the distance toward said other frame; and

a belt-like sheet disposed about the periphery of said two frames and adhesively secured to outer surfaces of said tongues and having said symbols thereon.

5. A reel assembly for a slot machine which is adapted to be fixed on the drive shaft of an electric motor and has symbols disposed on the outer periphery thereof, comprising:

a cylindrical body having said symbols on the periphery thereof; said cylindrical body comprising:

two frames of ring shape lying in two spaced parallel planes;

a plurality of arms extending radially and diagonally inwardly from one of said frames and secured at their inner ends to a central bridge plate parallel to said rings and spaced between said two planes; and

means for releasably securing said bridge plate to a said drive shaft of an electric motor.

4,621,816
SIDE STROKING GOLF PUTTER

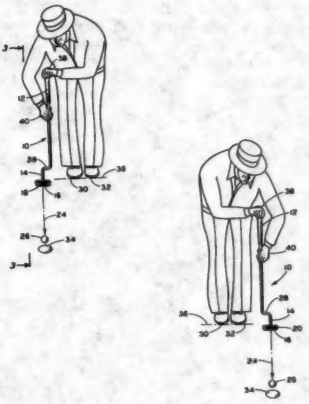
John G. Leek, 1503 Imperial Ave., New Hyde Park, N.Y. 11040

Filed Jun. 24, 1985, Ser. No. 748,310
Int. Cl.[4] A63B 53/04, 53/02
U.S. Cl. 273—168 4 Claims

1. A side stroking double-faced golf putter for swinging front and rear along the sides of the body in the direction of the length of the feet of the user comprising a head having elongated putting faces in opposite directions on said head for putting in opposite directions,

a shaft connected with said head to move the same through a putting swing in the opposite directions of said putting faces,

said shaft having an elongated vertical single handle portion for swinging the head in the opposite directions of said faces and a relatively shorter vertical shank portion connected with the head proximate the center of the length of the head above and centrally between said elongated putting faces and spaced remote from and non-aligned



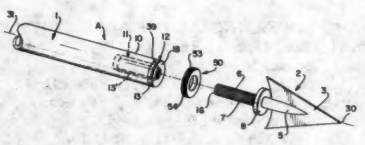
with said handle in a direction away from the side of the body of the user,

and said shaft having a connection portion offset from and substantially perpendicular to said vertical shank portion connecting said non-aligned shank and handle portions together in vertical spaced non-aligned relationship with said handle portion closer to the side of the body of the user than said shank portion, said connection portion being spaced remote from said handle portion and adjacent to said head and aligned with and between said elongated putting faces.

4,621,817
BROADHEAD ARROW WITH AXIAL ALIGNMENT DEVICE

John Musacchia, 3705 SW. 42nd Pl., Gainesville, Fla. 32801

Filed Dec. 11, 1985, Ser. No. 807,598
Int. Cl.[4] F41B 5/02
U.S. Cl. 273—421 13 Claims



1. An arrow including, a shaft provided with a longitudinally extending axis and having a forward portion at one end, an arrowhead provided with a longitudinally extending axis and having a blade and a rearwardly axially extending mounting stud removably attachable to said shaft forward portion, connection means within said shaft forward portion adapted to receive said arrowhead stud, said stud when engaging said shaft connection means allowing of limited radial displacement

of said arrowhead relative the longitudinal axis of said shaft, an alignment member having cam means and substantially surrounding said arrowhead stud intermediate said blade and said shaft forward portion whereby, radial displacement of said alignment member alters the relative disposition between said arrowhead longitudinal axis and shaft longitudinal axis to provide a properly balanced arrow about said axes.

4,621,818

HAMMER DRILL SPINDLE AND CHUCK ASSEMBLY

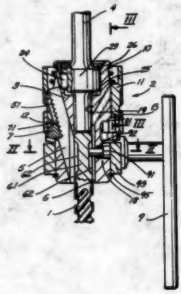
Günter H. Röhm, Heinrich-Röhm-Str. 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,655

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416966

Int. Cl.[4] B25D *17/08*; B23B *31/04*

U.S. Cl. 279—1 ME **8 Claims**



1. In a drill chuck of a hammer drill adapted to hold a drill bit wherein said drill chuck comprises a chuck body conformed for connection to a drive shaft transmitting hammer blows to said drill bit, a plurality of clamp jaws which are centered about and movable toward a central axis of said chuck and which define a drill-bit cavity coaxial with said chuck axis, a shaft of said drill bit being guided axially by and centered in said drill-bit cavity in engagement with said clamp jaws, and further a catch device for rotational locking of said drill bit against slipping in said drill chuck, the improvement wherein said clamp jaws are positioned axially along said drill bit shaft, and at least one catch is provided circumferentially between said clamp jaws, said catch being movable radially in said chuck body and securable to said drill bit so as to rotationally restrain said drill bit without loosening during drilling, when said drill bit is provided with at least one groove on said drill bit shaft for engagement with said catch, said catch being retractable whereby said drill chuck is able to hold both selectively smooth and grooved shafts of respective drill bits.

4,621,819

NONLOOSENING HAMMER-DRILL CHUCK

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Sep. 26, 1984, Ser. No. 654,791

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1983, 8327665[U]; May 8, 1984, 3416986

Int. Cl.[4] B23B *31/12*; G05G *5/18*

U.S. Cl. 279—1 K **4 Claims**

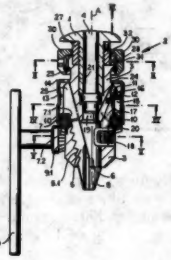
1. In combination with a hammer drill having a drive spindle rotatable about a spindle axis and a hammer displaceable axially in the drive spindle and with a drill bit having a shank, a chuck comprising:

a generally tubular chuck body centered on a chuck axis, formed with an axially extending guide, and having a central axially extending passage adapted to receive the shank of the drill bit, the body normally being carried on the spindle and receiving the shank of the drill bit in its passage with the spindle, shaft, and chuck axes all coaxial, the hammer projecting axially forward into the passage and being engageable therein with the bit;

a plurality of jaws radially but not angularly displaceable in the chuck body and having inner ends engageable with the drill-bit shank;

actuating means including a ring centered on the chuck axis, formed with an axially centered array of axially backwardly open recesses, rotatable thereabout on the chuck body, and coupled to the jaws for moving same radially synchronously and thereby centering the bit in the body by engagement of the inner ends with the shank;

latch means including at least one detent rotationally fixed



but axially displaceable in the guide on the body between a locking position engaging in the array of recesses for locking the ring and body against relative rotation and a freeing position out of blocking engagement with the recesses and permitting such relative rotation, the recesses and detent having engageable angled flanks, whereby forcible rotation of the ring on the body about the axis cams the detent into the freeing position;

a sleeve extending axially backward from the ring centered on the axis and defining with the body and at the guide an annular compartment in which the detent is contained; and

biasing means including a spring braced axially between the detent and the chuck body for urging the detent axially forward into the locking position.

4,621,820

PERCUSSION DRILLING APPARATUS

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Apr. 5, 1985, Ser. No. 720,259

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413581

Int. Cl.[4] B23B *31/08*

U.S. Cl. 279—1 B **16 Claims**

1. A percussion drill chuck assembly which comprises:

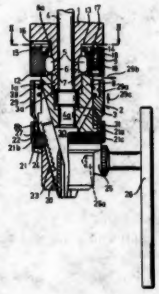
a hollow rotary drill spindle having an annular shoulder formed with a first annular surface facing in one axial direction;

a chuck body mounted on said spindle and formed with jaws adapted to receivably engage a drill bit, said spindle and said body having coaxial portions;

a ram extending axially through said spindle and into said body for impacting against said drill bit, said ram being axially movable relative to said spindle and said body;

coupling means between said portions and including a coupling ring surrounding said portions and having a plurality of selected positions of angular displacement relative to said spindle including a first position wherein said coupling means enables axial removal of said body from said spindle and second and third positions wherein said body is retained on said spindle, said ring having a second annular surface confronting said shoulder; and

respective formations on said first and second surfaces axially oriented in said second position of said ring relative to said spindle to permit limited axial displacement of said body relative to said spindle and being axially oriented to



support said first and second surfaces against one another in said third position of said ring whereby relative axial displacement of said body and said spindle is substantially blocked, said ring being braced against said body.

4,621,821

APPARATUS FOR THE CLAMPING OF ELONGATE WORKPIECES

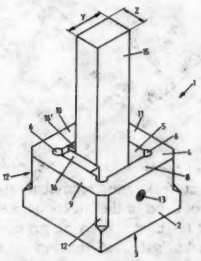
Rudolf Schneider, Reinach, Switzerland, assignor to Erowa AG, Reinach, Switzerland

Filed Sep. 21, 1984, Ser. No. 652,895

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3347403

Int. Cl.⁴ B23B *31/02*

U.S. Cl. 279—83 **12 Claims**



1. An apparatus for clamping an elongated workpiece comprising:

a clamping body having a first support surface for supporting said clamping body relative to a machining device and side wall surfaces extending transverse of said first support surface and defining at least in part a chamber for receiving the elongated workpiece therein, said chamber having a substantially square cross-section, said clamping body having a second support surface extending substantially parallel to said first support surface in spaced relationship thereto for supporting the elongated workpiece in said chamber and forming the bottom of said chamber;

said clamping body having at least one threaded hole extending transverse to said side wall surfaces;

at least one threaded clamping screw received in said one threaded hole for securing the elongated workpiece in said chamber; and

a plurality of plate-like inserts adapted to be selectively inserted between a surface of the elongated workpiece and a portion of said side wall surfaces forming one side of said square chamber in said clamping body to vary the size of said chamber to thereby provide for securing in said chamber elongated workpieces of different dimensions and in a central position relative to said chamber.

4,621,822

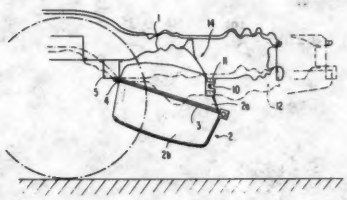
ARRANGEMENT OF A FUEL TANK IN THE REAR REGION OF A MOTOR VEHICLE

Fred Knöchelmann, Grafenau; Manfred Schulz, Wildberg, and Günther Ast, Horb, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 26, 1985, Ser. No. 748,829

Int. Cl.⁴ B60K *15/08*

U.S. Cl. 280—5 A **10 Claims**



1. An arrangement of a fuel tank in the rear region of a motor vehicle having lateral stringers beneath the vehicle floor, so that the fuel tank can yield in the case of rear deformation caused by an accident, comprising

means for connecting the fuel tank to parts fixed to the vehicle in the forward region of the fuel tank in the direction of travel,

guide bolts mounted laterally to the rear region of the fuel tank in the direction of travel and

guide means open towards the rear of the vehicle and fixed to the lateral stringers, and extending horizontally in the longitudinal direction of movement of the vehicle laterally retaining the guide bolts for releasing the fuel tank from support by said lateral stringers upon rear deformation of said vehicle.

4,621,823

STEERING SYSTEM FOR VEHICLES

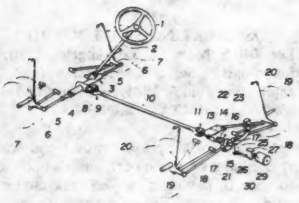
Shoichi Sano, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,679

Claims priority, application Japan, Oct. 17, 1983, 58-193670

Int. Cl.⁴ B62D *7/00*

U.S. Cl. 280—91 **9 Claims**



1. A steering system for vehicles, in which:

a rear wheel is steered in relation to the steering of a front wheel; and

the steered angle ratio of said rear wheel to said front wheel

is controlled to be variable in correspondence to the vehicle speed,

comprising:

interval setting means for setting by dividing the vehicle speed into a plurality of speed intervals; and

ratio setting means for setting for each of said speed intervals a single steered angle ratio, for thereby setting the steered angle ratio to be controlled stepwise variable with respect to the vehicle speed.

4,621,824

ELONGATED SPACER FOR ARRANGEMENT BETWEEN A MUD FLAP AND MOTOR VEHICLE FENDER FOLD

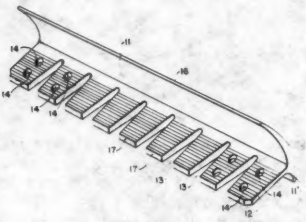
Knut Arenhold, Westend 7, 2000 Hamburg 52, Fed. Rep. of Germany

Filed May 28, 1985, Ser. No. 738,653

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1984, 3420986

Int. Cl.[4] B62D *25/16*

U.S. Cl. 280—154.5 R **19 Claims**



1. A spacer for disposition between an automobile mud flap and a fender fold of an automobile fender when the mud flap is attached to the fender fold comprising:

(1) an elongated outer portion adapted to be disposed in a generally vertical direction and to bear upon an outside portion of said automobile fender in an area adjacent to said fender fold and to bear upon an outer edge of said mud flap in an area of said mud flap which is directly attached to said fender fold:

(2) an elongated inner portion, having an inner-most edge and a juncture with said outer portion, projecting from said outer portion in a generally perpendicular direction, and adapted to be at least in part positioned between said mud flap and said fender fold when said mud flap is attached to said fender fold;

(3) at least one notch disposed laterally in said inner portion and extending from said inner-most edge of said inner portion to at least near said juncture of the inner portion and said outer portion.

4,621,825

OSCILLATING SKATEBOARD

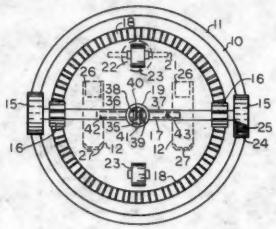
Robert E. Lee, 640 S. Main St., Los Angeles, Calif. 90014

Continuation-in-part of Ser. No. 555,272, Nov. 16, 1983. This application Jun. 6, 1984, Ser. No. 617,992

Int. Cl.[4] B62M *1/04*

U.S. Cl. 280—218 **2 Claims**

1. In a skateboard for supporting a user and adapted to be propelled by oscillatory motion of the user's body, comprising a suitable footboard, having a curved rack mounted on said footboard, said rack having a plurality of teeth on its surface, a support boss extending below said footboard along a central vertical axis thereof, said support boss having an integral spindle at its upper end, bearing means for rotatably supporting said footboard with respect to said support boss, said support boss having an aperture means through its lower portion for receiving the inner ends of two independently rotatable diametrically opposite axles, a clutched pinion secured to each said axle for engagement with said rack, a wheel means secured



to the outer end of each said axle, and castors suitably secured to said footboard.

4,621,826

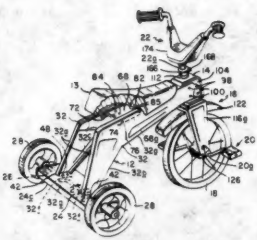
KNOCK-DOWN TRICYCLE

William H. Ziegler, Jr., Opelika, Ala., assignor to Hedstrom Corporation, Bedford, Pa.

Filed Aug. 19, 1985, Ser. No. 766,699

Int. Cl.[4] B62K *9/02, 15/00;* B62M *1/02*

U.S. Cl. 280—259 **23 Claims**



1. In a tricycle of the type having a backbone with a longitudinal axis, a front fork and handlebar assembly pivotally mounted to the front end of the backbone, a rear axle mounted to the rear end of the backbone lying generally perpendicular to said longitudinal axis thereof, the improvement wherein the backbone comprises

A. a pair of spaced-apart parallel plates, each having an upper front end and a lower rear end;

B. a head block positioned between said plates at the front ends thereof, said block including means for journaling said front fork and handlebar assembly;

C. means for connecting the plate front ends to said block;

D. a rear step plate;

E. means for connecting each said plate rear end to said step plate, said connecting means including

1. a slot in the rear step plate,

2. a tab extending from the rear end of said plate through said step plate slot, said tab including a lateral jog which extends flush against the underside of said rear step plate; and

3. one or more fasteners connected between said tab jog and said step plate; and

F. seating means connected between said plates the ends thereof, said plates, head block and seating means forming a rigid beam structure for supporting a rider.

4,621,827

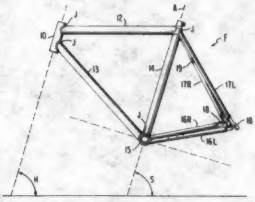
LIGHT WEIGHT BICYCLE WITH IMPROVED CHAINSTAY STRUCTURE AND METHOD

Gary G. Klein, 207B S. Prairie, Chehalis, Wash. 98532

Continuation-in-part of Ser. No. 849,141, Nov. 7, 1977, Pat. No. 4,500,103, and a continuation-in-part of Ser. No. 658,620, Feb. 7, 1976, abandoned. This application Feb. 2, 1984, Ser. No. 576,437

Int. Cl.[4] B62K *3/04*

U.S. Cl. 280—281 R 6 Claims



1. In a bicycle having a bottom bracket and a chainside chainstay and a non-chainside chainstay tubes, each secured to and extending rearwardly from said bottom bracket, pedals, crank and front drive sprocket carried in said bottom bracket a rear drive sprocket and hub assembly carried at the rear ends of said chainstay tubes and a drive chain trained over said front and rear drive sprockets, the improvement wherein the chainside chainstay tube has at least 10 percent more axial rigidity than the non-chainside chainstay tube.

4,621,828

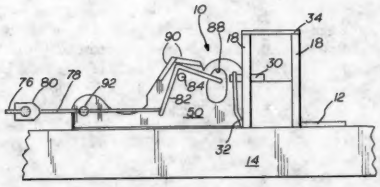
SAFETY BINDING FOR NORDIC SKIIS

Edward E. Adams, P.O. Box 481, Mackay, Id. 83251, and Robert L. Brown, 3016 Secor Ave., Bozeman, Mont. 59715

Filed Sep. 27, 1984, Ser. No. 655,039

Int. Cl.[4] A63L *9/086*

U.S. Cl. 280—615 9 Claims



1. An improved ski binding for use with a boot and cross country ski, the boot having a sole which has a portion projecting in the forward direction from the toe of the ski comprising:

a toe plate adapted to be located under and adjacent the forward portion of the ski boot;

a bail means for releasably clamping the forwardly extending portion of the sole of the ski boot to the toe plate;

the bail having a pair of bell crank members each having a first arm and a second arm and each being mounted for rotational movement around a respective pin mounted to the toe plate;

the bell crank members further being connected together with an elongate connecting member, each end of which is secured to a respective first arm of the bell crank members;

the connecting member being adapted to clamp down on the forwardly extending portion of the sole of the ski boot;

an elastic strap having the two ends thereof attached to the respective second arms of each bell crank member and wherein the median of the elastic strap is adapted to be positioned adjacent the heel of the boot;

the bail being positioned so that upon rotation of the bell cranks around their respective pins by movement of the elastic strap to secure the ski boot to the toe plate, the connecting member is rotated downwardly to clamp the forwardly extending portion of the sole of the ski boot between the connecting member and the toe plate;

a pair of open faced sockets which are mounted to the ski and which are disposed along a straight line perpendicular to the longitudinal axis of the ski;

a toe piece secured to the toe plate;

the toe piece having a pair of release buttons, each release button being received by a corresponding one of the open faced sockets; and

means for resiliently urging the release buttons into their corresponding sockets whereby the toe piece and thus the ski boot is releasably held by the sockets to the ski.

4,621,829

SAFETY SKI BINDING

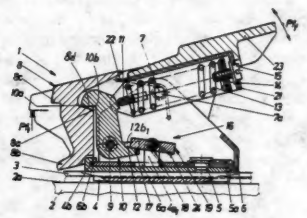
Erwin Krob, and Helmut Bauer, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Dec. 8, 1982, Ser. No. 447,864

Claims priority, application Austria, Nov. 11, 1981, 5306/81

Int. Cl.[4] A63C *9/085*

U.S. Cl. 280—628 10 Claims



1. In a safety ski binding which is adapted to be secured to a ski and includes a sole holder which is pivotal about a transverse axis and a vertical axis and is releasably held in a position in which it holds a ski shoe by a locking mechanism which yields only after predetermined release forces are exceeded, the effective release force being reduced with an increasing change from the vertical in the direction of application thereof, wherein first and second locking parts of said locking mechanism are provided at spaced locations on a swingable lever, and a first complementary locking part which is engageable with said first locking part is provided on a rear region of said sole holder and a second complementary locking part which is engageable with said second locking part is provided on a structural part which is fixable with respect to the ski, and wherein said lever is supported for pivotal movement about a holding axle which extends parallel to said transverse axis and which is in turn supported on a support member which is pivotal about a pivot pin which defines said vertical axis and is anchored in a base plate adapted to be secured to the ski, said lever having on a side thereof remote from said locking parts a control surface which is biased by a release spring, the improvement comprising wherein said second complementary locking part is formed by a further control surface provided on a balance bar which is movably supported on said structural part, and wherein said balance bar is resiliently biased with respect to a ski-fixed mounting of said structural part by at least one biasing spring which is interpositioned between said balance bar and said mounting and which urges said second complementary locking part in a direction toward said second locking part.

4,621,830

AUTOMOTIVE SUSPENSION SYSTEM

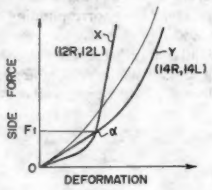
Seita Kanai, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

Filed Jan. 9, 1985, Ser. No. 689,958

Claims priority, application Japan, Jan. 13, 1984, 59-3671; Jan. 13, 1984, 59-3672

Int. Cl.[4] B60G 3/04

U.S. Cl. 280—675 20 Claims



1. An automotive suspension system comprising a wheel support for supporting a wheel, and a wheel supporting member for connecting the wheel support to the vehicle body wherein the wheel supporting member includes front and rear resilient supporting means spaced from each other by a predetermined distance in the longitudinal direction of the vehicle body and the direction of the toe of the wheel is adapted to be changed according to deformation of the front and rear resilient supporting means, the load-deformation characteristics of the front and rear resilient supporting means being selected so that the ratio of the amount of deformation of the front resilient supporting means for a given load to that of the rear resilient supporting means for the same load changes according to the magnitude of external side forces acting on the wheel, thereby changing the steering characteristics according to the magnitude of external force, said deformation being that in right and left or width directions of the vehicle body caused by said side forces.

4,621,831

STABILIZER FOR MOTOR VEHICLE

Ichiro Takadera, Tokyo, and Shigeru Kuroda, Yokohama, both of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Aug. 23, 1985, Ser. No. 769,001

Claims priority, application Japan, Sep. 6, 1984, 59-186691; Sep. 26, 1984, 59-201346; Dec. 14, 1984, 59-264196

Int. Cl.[4] B60G 19/00

U.S. Cl. 280—689 11 Claims

1. A stabilizer for a motor vehicle comprising:

a rod-shaped torsion section extending in the transverse direction of a motor vehicle;

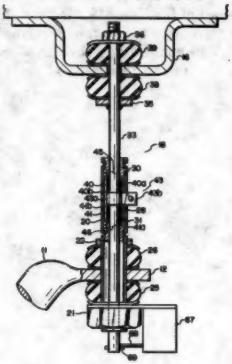
a pair of arm sections continuous with both ends of the torsion section and extending in the longitudinal direction of the motor vehicle;

a first member attached to the torsion section or at least one of the arm sections and formed with an axially penetrating cylindrical bore;

a columnar second member inserted in the bore of the first member;

at least one coil spring disposed between the inner peripheral surface of the bore of the first member and the outer peripheral surface of the second member and wound around the second member, at least one end of said coil spring being a free end;

an operating member connected to the free end of the coil spring, at least a part of said operating member being located outside the first member; and



drive means coupled to the operating member and adapted to apply a force in a direction such that the diameter of the coil spring is increased or reduced.

4,621,832

SHOCK ABSORBER CONTROL SYSTEM

Noriyuki Nakashima, Nagoya; Yoshinori Ishiguro, Kariya; Kohji Kamiya, Chita; Hiroshi Miyata, Toyota; Kazumasa Nakamura, Okazaki, and Naoyasu Sugimoto, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 27, 1983, Ser. No. 565,791

Claims priority, application Japan, Dec. 27, 1982, 57-229884; Dec. 27, 1982, 57-229885; Dec. 27, 1982, 57-229886

Int. Cl.[4] B60G 11/28

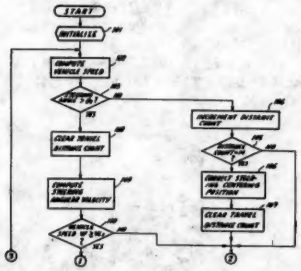
U.S. Cl. 280—707 9 Claims

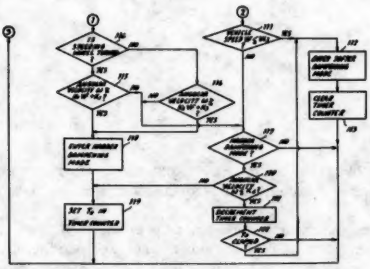
1. A shock absorber control system for controlling at least one shock absorber having a dampening force adjustable in response to operation of steering means of a vehicle, said shock absorber control system comprising:

(a) signal generator means for generating a signal in response to operation of the steering means; and

(b) control means including first means responsive to the signal from said signal generator means for determining whether the steering means is turned or returned, second means responsive to the signal from said signal generator means for computing an angular velocity of operation of the steering means, third means for comparing the computed angular velocity with a reference value to issue a first signal indicative of an increased dampening force when the computed angular velocity exceeds said reference angular velocity and to issue a second signal indicative of a reduced dampening force when the computed angular velocity is below said reference angular velocity, said reference angular velocity being smaller when the steering means is determined as being turned by said second means than when the steering means is determined as

being returned, and fourth means for actuating the shock absorber to selectively produce said increased and reduced dampening forces in response to said first and second signals, respectively.





4,621,833

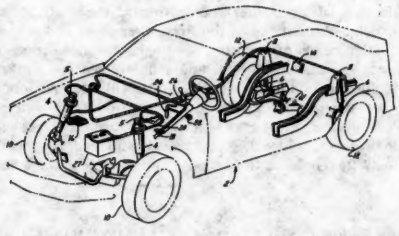
CONTROL SYSTEM FOR MULTISTABLE SUSPENSION UNIT

Michael W. Soltis, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 16, 1985, Ser. No. 809,672

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—707 **19 Claims**



1. An operating system for a multistable suspension unit having a plurality of predetermined operating states and beind adapted for use with a motor vehicle with a steering system, said operating system comprising:

first means for measuring the speed of said motor vehicle; and

second means for predicting the lateral acceleration of said motor vehicle, said second means comprising:

centering means for dynamically determining a center position for the steering system of said motor vehicle;

angle measuring means operatively associated with said centering means for measuring an excursion angle of said steering system from said predetermined center position; and

processing means coupled to said first means and to said angle measuring means for combining the measured values of vehicle speed and steering system excursion angle according to a predetermined formula so as to yield, as a function of vehicle speed and steering system excursion angle, a calculated value for predicting lateral acceleration to be used in selecting one of said plurality of predetermined operating states.

4,621,834

SUSPENSION SYSTEM FOR A SET OF VEHICLE WHEELS WITH RIGID AXLE

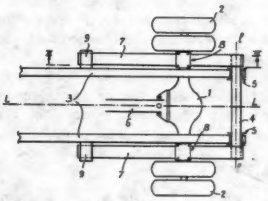
Jacques Aubry, Cabries; Michel Bonfils, St. Cannat, and Jean-Paul Merlet, Mimet, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Mar. 28, 1985, Ser. No. 717,038

Claims priority, application France, Apr. 3, 1984, 84 05246

Int. Cl.[4] B60G *9/04, 11/44;* **B62D** *53/06*

U.S. Cl. 280—715 **15 Claims**



1. A suspension system for a set of vehicle wheels with rigid axle, comprising:

a horizontal and transverse torsion bar made of a composite high resistance fiber-synthetic resin material and articulated on the chassis of the vehicle so as to be able only to rotate about its longitudinal axis; and

two longitudinal elastic blades made of a composite high resistance fiber-synthetic resin material disosed laterally each on one side of said chassis, of which each is rigidly and directly connected at one of its ends to said torsion bar, is fixed in its intermediate part to said rigid axle and is in abutment at its other end against said chassis.

4,621,835

TWO RETRACTOR PASSIVE RESTRAINT SYSTEM

Timothy P. Edwards, Mount Clemens, Mich., assignor to American Safety Equipment Corporation, Troy, Mich.

Filed Jun. 5, 1985, Ser. No. 741,461

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—803 **4 Claims**

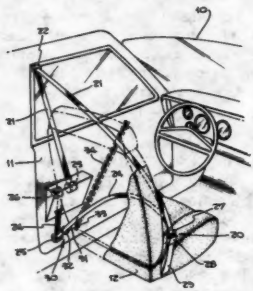
3. A safety belt restraint system for restraining a passenger in a seat of a moving vehicle having a releasable anchor means inboard of the passenger seat for releasably holding a seat belt connector fitting and a vehicle door outboard of the vehicle seat with a shoulder strap guide on an upper portion of the door frame, said restraint system comprising:

a pair of emergency locking safety belt retractors mounted in relatively close proximity to each other on said vehicle door near a lower portion thereof;

connector fitting means for releasable connection of a safety belt to said anchor means;

a safety belt having its opposite ends operably connected into individual ones of said pair retractors for retraction

and protraction at both ends thereof relative said retractors, said belt including a first strap passing between said connection fitting and one of said retractors to provide a lap belt portion of said system and a second strap passing between said connector fitting and the other of said retractors and through said shoulder strap guide to provide a shoulder belt portion of the system;



motor driven strap lifting means cooperating with said first strap which provides said lap belt portion to lift said lap belt portion relative to said vehicle seat through operation of an associated motor means when said vehicle door is opened; and

deactivating means associated with said releasable anchor means for deactivating the motor means of said strap lifting means in response to removal of said connector fitting from said anchor means.

4,621,836

MOUNTING CONSTRUCTION OF WEBBING RETRACTOR

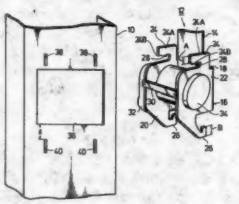
Shinji Mori, and Keiichi Tamura, both of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Jan. 8, 1985, Ser. No. 689,786

Claims priority, application Japan, Jan. 13, 1984, 59-3797[U]

Int. Cl.[4] A62B *35/00*; B60R *21/10*

U.S. Cl. 280—807 **21 Claims**



1. A structure for mounting a webbing retractor adapted for use in a seatbelt system of a vehicle, comprising:

(a) an opening for receiving the webbing retractor formed on a panel of a vehicle body;

(b) a plurality of engaging holes formed in said panel, a first of said plurality of engaging holes formed on a first side of said opening, a second of said plurality of engaging holes formed on a second side of said opening;

(c) at least one first engaging means provided on the webbing retractor and adapted to be secured to said first engaging hole from a back side of the panel; and

(d) at least one second engaging means provided on the webbing retractor and adapted to be secured to said second engaging hole from a front side of the panel,

whereby the webbing retractor can readily be mounted on the vehicle body.

4,621,837

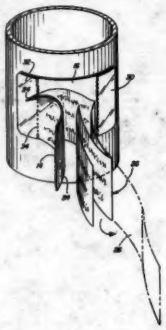
MULTI-LAYERED LABEL

Jory B. Mack, Chicago, Ill., assignor to Pamco Label Co., Rosemont, Ill.

Filed Jan. 31, 1985, Ser. No. 696,773

Int. Cl.[4] B42D *15/00*; G09F *3/00*; B41L *1/20*

U.S. Cl. 283—105 **14 Claims**



1. In a multi-layered label which may be torn open to expose an interior leaflet, the improvement comprising, in combination:

first outer and second inner cover sheets with an adhesive layer on at least one side thereof, and peripherally sealed together, and a separate multi-layer leaflet member positioned between said first and second cover sheets, at least one layer of said leaflet member being adhered to an internal face of one of said first and second sheets, and a line of tearing weakness in said first cover sheet to permit opening thereof for access to said leaflet member.

12. In a multi-layered label which may be torn open to expose an interior leaflet, the improvement comprising, in combination:

first and second cover sheets sealed together at opposed ends, and a multi-layer, folded leaflet member positioned between said first and second cover sheets, at least one layer of said leaflet member being bonded to an inner face of said first cover sheet, a portion of said last layer of the leaflet member adjacent the second cover sheet being folded over said one layer adjacent one opposed end to form a tab portion extending toward the center of said label, a slot defined in the first cover sheet and cover of leaflet member in registry, positioned and proportioned to receive said tab portion, and a line of tearing weakness defined in said first cover sheet adjacent said one opposed end, whereby breaking of said line of tearing weakness permits said first cover sheet to be opened to expose said milti-layer, folded leaflet member, and said tab member may then be used to fit in said slot to reclose the label.

4,621,838

INSERT FOR INSULATED STEAM INJECTION TUBING

Kurt E. Kneidel, Alliance, and Minh Luu, N. Canton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

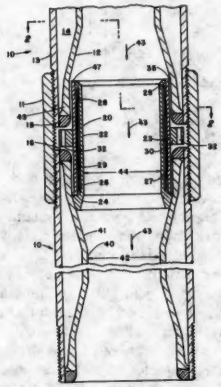
Filed May 7, 1984, Ser. No. 607,861

Int. Cl.[4] F16L *55/00*

U.S. Cl. 285—41 **30 Claims**

1. Apparatus for conveying a vapor, the apparatus comprising a tubing string of at least two tubular segments, means for coupling the tubular segments to each other with opposed ends

in axially spaced relationship whereby a gap is defined therebetween, each tubular segment including an outer tube and an inner tube concentrically disposed within the outer tube and spaced therefrom to define an annulus therebetween, the inner tube having a cylindrical body with end portions which extends radially outwardly to and are joined to the outer tube, insulating means provided in the annulus, the cylindrical body having a cylindrical bore path for conveying a vapor, a cylindrical insert disposed to overlie the end portions of the opposed ends of tube sections radially inwardly thereof, means



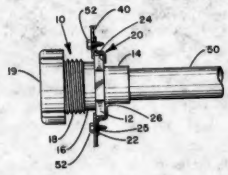
for engaging the insert to one of the end portions, said insert being spaced apart radially from the other of the end portions whereby vapor is passed from the bore path to the gap so that condensation of the vapor may provide insulation means in the gap, and wherein said insert comprises a cylindrical inner member and a cylindrical outer member, said cylindrical outer member surrounds said cylindrical inner member and is spaced therefrom to define an annular space therebetween, and said inner and outer members are joined at their ends, and further comprising thermal insulation means in said annular space.

4,621,839

METHOD AND APPARATUS FOR MOUNTING COUPLING AND TUBE ASSEMBLIES TO SUPPORTS

Richard J. Duell, Syracuse, and Charles E. Whipple, Brewerton, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 24, 1983, Ser. No. 507,610
Int. Cl.[4] F16L *3/00*
U.S. Cl. 285—61 **5 Claims**



1. Apparatus for securing a tubing assembly for use in a heat exchanger unit in a selected position and in a selected orientation which comprises:

a planar mounting bracket defining an opening and arcuate fastening slots spaced from the opening;

a coupling including a coupling body sized to extend through the opening in the mounting bracket, a head portion extending radially outwardly from the coupling body and sized larger than the mounting bracket opening and a bell portion extending axially from the head portion of the coupling body;

tubing connected to the coupling without regard to the rotational orientation of the coupling at the bell portion thereof, said tubing having a desired orientation relative to the unit;

a mounting flange defining a bell opening through which the bell portion of the coupling extends, a head receiving cavity sized to contain the head portion of the coupling and at least one fastening opening;

means for limiting the rotation of the head portion within said head receiving cavity; and

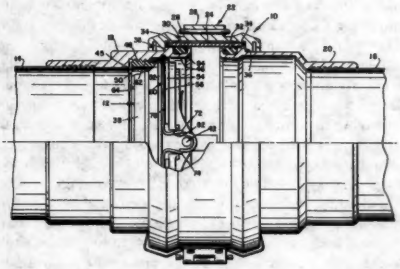
fastening means extending through at least one of said arcuate fastening slots to engage said fastening opening of the mounting flange to secure the coupling head portion between the mounting flange and the mounting bracket, said fastening means being positioned within the fastening slot to prevent relative rotation between said mounting bracket and said mounting flange to place thereby and hold the tubing in the desired rotational orientation relative to the mounting bracket.

4,621,840

SELF-LOCKING, SELECTIVELY RELEASABLE MECHANISM FOR LOCKING STRUCTURAL PARTS TOGETHER WITH LOAD RELIEVING RETENTION

Frank L. Foster, Lakewood, Colo., assignor to Stanley Aviation Corporation, Aurora, Colo.

Filed Oct. 31, 1983, Ser. No. 547,132
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—81 **9 Claims**



1. An assembly comprising a female threaded member, a male threaded member threaded into said female member, a spring member terminating in free spaced apart end portions and having a curved body portion extending between said end portions, said female member having a radially inwardly opening circumferentailly extending groove and said male member having a radially extending outwardly opening circumferentially extending groove, said grooves being radially opposed to one another for receiving said spring member when said male member is threaded into said female member, the curvature of said spring member being such that when the spring member is received in both of said grooves it locks said male and female members against relative axial displacement, the groove on one of said male and female members being circumferentailly interrupted to define an opening, said end portions of said spring member extending transversely of said body portion and through said opening for access to enable the end portions to be gripped and moved relative to each other to flex said body portion to a shape where it it entirely removed from one of said grooves to thereby unlock said male and female members from one another thereby permitting said male and female members to be disengaged from one another.

4,621,841

TUBULAR COUPLER WITH RETAINER

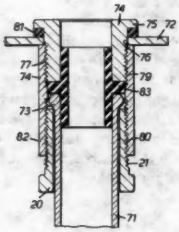
Douglas H. Wakefield, Stone, Great Britain, assignor to Corning Limited, Sunderland, England

Continuation of Ser. No. 374,929, May 5, 1982. This application Sep. 23, 1985, Ser. No. 779,307

Claims priority, application United Kingdom, May 15, 1982, 8114970

Int. Cl.[4] F16L *41/00*

U.S. Cl. 285—158 6 Claims



1. A coupling formed between two rigid and undeformable coaxial tubular members, one of which tubular members is rigid, undeformable, has a smooth outer surface undergoes an increase in external diameter at a mouth region thereof in the form of a rounded circumferential flange at which it is to be coupled to the other tubular member and is of substantially uniform internal diameter in said mouth region, the coupling comprising a single annular retaining member disposed around said one tubular member along a portion of the length thereof and being formed separately from said one tubular member, the annular retaining member being a one-piece split-ring member of synthetic plastic material having a cylindrical inner surface and having straight cylindrical external threads, said retaining member being formed with a slit extending therethrough along the entire length thereof in a direction parallel to its cylinder axis providing abutting longitudinally extending faces at the slit and being sufficiently elastically deformable to permit its expansion to define an opening sufficiently larger in cross-section than said increased diameter portion of said one tubular member for the retaining member to be fitted around said portion of the length of said one tubular member, the external diameter of said portion of the length of said one tubular member and the internal diameter of said retaining member being matched so that, in the coupling with the retaining member emplaced on said portion of the length of said one tubular member, said faces are in abutment along their entire length creating a continuous ring of said synthetic plastic material in intimate contact with the exterior of said portion of the length of said one tubular member to apply equal pressure around the one tubular member throughout the area of contact, with the internal diameter of said retaining member being smaller than the maximum external diameter of said one tubular member at said mouth region thereof, the retaining member being retained on said one tubular member against withdrawal lengthwise from said one tubular member at said mouth region thereof while retaining said faces thereof in abutment, as a result of the retaining member being in operative screw-threaded engagement with the other of said tubular members and in engagement with said rounded circumferential flange, which coupling additionally comprises a resilient sealing element positioned forwardly of and adjacent to said mouth region, means fixing said sealing element to said other tubular member to provide fluid-tight seal between said tubular members.

4,621,842

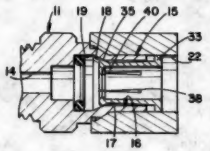
RELEASABLE PUSH-TO-CONNECT TUBE FITTING

Leonard J. Kowal, Prospect Heights; Albert J. Schwarz, Lincolnwood, and Norman B. Wells, Skokie, all of Ill., assignors to Imperial Clevite Inc., Glenview, Ill.

Filed Mar. 4, 1985, Ser. No. 708,164

Int. Cl.[4] F16L *21/06*

U.S. Cl. 285—322 10 Claims



1. A releasable tube fitting comprising:

a body provided with a through bore, said body having an axially outer end defining a radially inner surface defining the axially outer end of said bore and including an axially outer first cylindrical portion, and an axially inwardly widening frustoconical axially inner portion; and

an annular collet for coaxially receiving the end of a tube for connection to said body, said collet defining an axis and being coaxially received in said bore outer end and having a tubular midportion, an axially outer radially outwardly turned flange axially outwardly of said body outer end and having an outer diameter greater than the diameter of the axially outer end of the bore and no greater than the minimum outer diameter of said body outer end for ease of tube release, and to allow a deforming tool to pass thereover to form said axially outer first cylindrical portion and said axially inwardly widening frustoconical axially inner portion an axially inner end radially inwardly of said frustoconical inner portion of the bore outer end and having a radially outwardly projecting camming portion, and a radially inwardly directed tube gripping portion, said collet further having at least one longitudinally extending slot at said axially inner end permitting constriction of said collet inner end as an incident of the collet being urged axially outwardly with said camming portion engaging said frustoconcial bore surface portion, the total slot width circumferentially of the collet axis being preselected to cause the minimum outer diameter of said camming portion when said inner end of the collet is fully radially constricted to be greater than the diameter of the outer end of said frustoconical bore surface portion.

4,621,843

TUBE COUPLING

Robert D. Straub, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

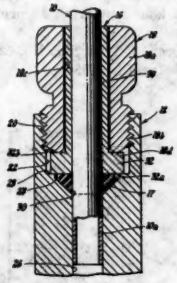
Filed Oct. 23, 1985, Ser. No. 790,397

Int. Cl.[4] F16L *19/00*

U.S. Cl. 285—356 2 Claims

1. A tube coupling assembly including a coupling body means having a stepped bore therein defining at least a first wall, a seal ring receiving wall and a tube receiving wall defining a fluid passage, each of said walls being of progressively reduced internal diameter in the order named, said first wall and said seal receiving wall being interconnected by a flat shoulder and said seal receiving wall and said tube receiving wall being interconnected by an annular frusto conical shoulder, a tube of uniform external diameter and thickness has a free end thereof slidably received in said tube receiving wall, a ferrule is sealingly fixed to and encircles said tube adjacent to said free end, said ferrule including an annular radial outward extending flange of an external diameter so as to be loosely received in said first wall of said body means and defining

opposed first and second radial walls and having a tubular stem extending from said second radial wall a predetermined axial extent, said first radial wall being located axially a predetermined distance from said free end of said tube for abutment against said flat shoulder, a seal ring encircling said free end of said tube in abutment against said first radial wall and sealingly engaging said frusto conical shoulder; and, a tubular nut, with



a bore therethrough of an axial extent corresponding substantially to the axial extent of said tubular stem so as to slidably encircle said tubular stem of said ferrule and so as to be threadingly engaged with said coupling body means for abutment against said second radial wall whereby to force said first radial wall of said ferrule into sealing engagement against said flat shoulder.

4,621,844

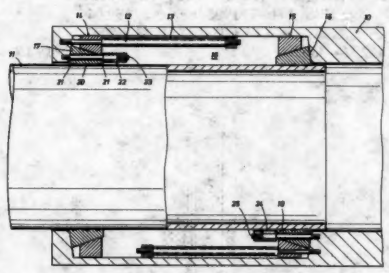
MEMORY METAL CONNECTOR

Robert M. Kipp, and Ray R. Ayers, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 342,536, Jan. 25, 1982, abandoned. This application Sep. 6, 1984, Ser. No. 647,874

Int. Cl.[4] F16L *25/00*

U.S. Cl. 285—381 **23 Claims**



1. Apparatus for gripping a pipe comprising:

a housing which encloses at least part of the pipe and defines an elongated space between the housing and the pipe, said elongated space containing at least two wedges, one wedge contacting the housing and the other wedge contacting the pipe, each wedge having a slanting surface and a slanting surface of the one wedge being in contact with an oppositely slanting surface of the other wedge; and

memory metal means functional upon activation to apply a lateral force within the elongated space between the housing and the pipe against one of the two wedges to force the slanting surface of one of the two wedges against the oppositely slanting surface of the other of the two wedges, the opposite sides of the two wedges from the respective slanting surfaces being functional to press respectively against the housing and the pipe, thereby securing the housing to the pipe.

4,621,845

INTEGRAL PERIPHERAL LOCKING DEVICE FOR CLOSURES

Joseph Vanago, 1, rue des Chaux Villefranche-le-Haut, Lyon, France (F-69340)

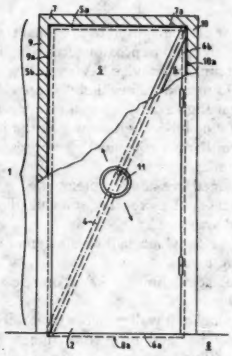
PCT No. PCT/FR83/00186, § 371 Date May 14, 1984, § 102(e) Date May 14, 1984, PCT Pub. No. WO84/01181, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 20, 1983, Ser. No. 616,226

Claims priority, application France, Sep. 21, 1982, 82 16073

Int. Cl.[4] E05C *9/04, 9/14*

U.S. Cl. 292—37 **10 Claims**



1. A closure and locking system comprising:

(a) a fixed frame having opposed stile members, a top rail member, and a threshold member interconnecting the stile members, each member having an aligned slot which form a continuous recess in the frame;

(b) a closure for the frame movably mounted on the frame;

(c) a locking device for locking the closure in a closed position, said locking device comprising only two substantially identical, opposed, solid and rigid triangular locking elements reciprocatingly mounted on the closure to project in opposite directions along a first imaginary diagonal line within the closure between an unlocked and a locked position, wherein when said triangular locking elements are in said unlocked position, said triangular locking elements retract along said first imaginary diagonal line until their entire outer edges are substantially flush with the entire outer edges of said closure and the inner edges of the triangular locking elements come to rest substantially adjacent to one another along a second imaginary diagonal line within the closure, said first and second imaginary diagonal lines crossing each other in substantially a central point of said closure, and wherein when said triangular locking elements are in said locked position, said triangular locking elements project in opposite directions along said first imaginary diagonal line until the outer edges of one of said triangular locking elements enter the slots of one of said stile members and said top rail member, and the outer edges of the other of said triangular locking elements enter the slots of the other stile member and said threshold member;

(d) means for projecting and retracting said triangular locking elements; and

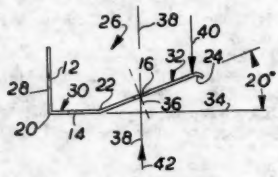
(e) means for guiding the movement of said triangular locking elements.

4,621,846

LOCK FOR SLIDING DOORS

Don Lefor, 133 Lakeview Way, Oldsmar, Fla. 33557

Filed Oct. 1, 1984, Ser. No. 656,521
Int. Cl.[4] E05C *19/06*
U.S. Cl. 292—152 **2 Claims**



1. A device that prevents distal to proximal travel of a pin in a bore responsive to distal to proximal forces acting against the distal end of said pin, said device having utility in the environment of sliding doors and frames therefor provided with independent bores that align axially when the doors are fully closed to collectively define a bore within which the pin is slideably mounted, wherein the improvement comprises:

a flat base member,

an aperture formed in said base member,

a fastening means such as a screw or a nail adapted to extend through said aperture,

a support surface to which said base member is mounted by said fastening means,

said support surface defining a frame of a door to be locked by said device,

a flat, elongate inclined wall member integrally formed with said base member and projecting therefrom in a plane angularly disposed relative to a plane of said base member,

an aperture formed in said inclined wall member near the distal free end thereof,

a pin extending through the aperture formed in said wall member and through a bore collectively defined by a first bore formed in a first sliding door and a second bore formed in a second sliding door when said doors are fully closed,

said pin being disposed normal to a plane of said support surface when said pin is positioned in said aperture,

said wall member inclined by an angular amount sufficient to cause the circumferential edges of said aperture formed therein to frictionally engage said pin when said wall member is in its equilibrium disposition,

said frictional engagement of said pin and said aperture formed in said inclined wall member being maintained when said pin is displaced in a distal to proximal direction, which displacement accordingly imparts distal to proximal displacement to said wall member, which latter displacement serves to increase the angular orientation of said aperture formed in said wall member relative to said pin and to thereby increase the amount of friction appearing between said aperture and said pin,

said wall member and said base member formed of a semi-rigid, flexible and resilient material so that the angular disposition of the wall member relative to the base member is maintained in the absence of external forces acting against said wall member and so that the angular disposition is changed responsive to the application of external forces to said wall member,

said aperture formed in said wall member releasing its frictional engagement with said pin when said wall member is displaced by external forces in a proximal to distal direction, which displacement reduces the amount of angular displacement of said aperture relative to said pin so that said pin can be removed from said aperture and said bore,

the angular disposition between the inclined wall member and the base member being approximately twenty degrees,

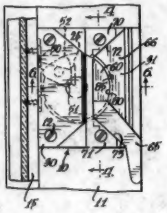
and said device further including an apertured member that is bent ninety degrees relative to the base member.

4,621,847

SASH LOCK

Gary F. Paulson, Waseca, and Gregory J. Vetter, Owatonna, both of Minn., assignors to Truth Incorporated, Owatonna, Minn.

Filed Dec. 13, 1984, Ser. No. 681,490
Int. Cl.[4] E05C *3/10*
U.S. Cl. 292—199 **10 Claims**



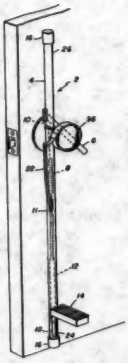
1. A sash lock having a case with two sections, one section having an open interior in which a movable lock member is positioned, the other section being adjacent said first section and having a top wall with an opening which is a segment of a circle and having a curved edge, an operating member carrying said lock member, a pivot mounting for said operating member at a distance from the curved edge of said opening, said operating member having a part positioned to fill said opening and having a curved peripheral flange underlying said curved edge to close said opening, and a handle secured to the upper side of said operating member part.

4,621,848

PORTABLE FOOT OPERATED DOOR OPENER

Robert E. Pierce, Box 134, Pittsburg, N.H. 03592

Filed Feb. 7, 1985, Ser. No. 699,040
Int. Cl.[4] E05C *1/16, 13/06*
U.S. Cl. 292—336.3 **14 Claims**



1. A portable foot operated door opener comprising

(a) an elongated tubular member having upper and lower ends;

(b) hook means integral to the tubular member positioned between the upper and lower ends, the hook means and

the tubular member forming a means adapted to fit over the spindle of a door knob shaft to hold the tubular member on the door;

(c) a pedal member slidingly affixed for vertical movement in the lower end of the tubular member;

(d) flexible band member for engaging a door knob flexibly coupled to the pedal member;

(e) resilient means interior to the tubular member a portion of which extends through an opening in the tubular member below the hooks means, the resilient means having an upper end fixed to the tubular member and a lower end of the resilient means fixed to the pedal member such that when the flexible band member, linked to the pedal member by way of the resilient means, is in an engaging relationship with a door knob a downward force on the pedal member causes the door knob to rotate and disengage the door latch.

4,621,849

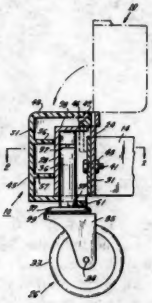
BUMPER FOR WHEEL WELL

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Nov. 13, 1984, Ser. No. 670,068

Int. Cl.[4] B60R *19/24, 19/30*

U.S. Cl. 293—155 **16 Claims**



1. A bumper unit constructed as a single molded plastic element and including:

a cap having a lower side, an upper side, and a rear side and defining a chamber having an opening at the rear side of said cap; a lock at the upper side of the cap extending generally away from the cap; and a hinge interposed between said cap and said lock;

said chamber being adapted to receive a protruding bracket section of a swivel type caster assembly, said bracket section being insertable into said chamber through said opening;

means for securing said lock to said assembly;

said hinge defining a center about which said cap is pivotable relative to said lock from a first position wherein said unit is formed and at which said first position the lock extends away from said cap, to a second position; and,

when in said second position, said lock being located at said rear side of said cap, in registration with said opening.

4,621,850

COIL REMOVAL APPARATUS FOR A DYNAMOELECTRIC GENERATOR

Dale T. Wiersema, Bellevue, and Fred Kirschensteiner, Forest Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 26, 1985, Ser. No. 749,024

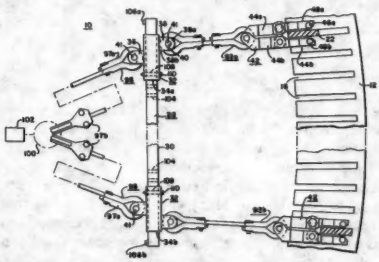
Int. Cl.[4] B23P *19/04;* **B66C** *1/48*

U.S. Cl. 294—81.61 **13 Claims**

1. A coil removal apparatus for a dynamoelectric generator, said generator having a stator core, said stator core having a plurality of vertical slots therein around the inner periphery of said core, a plurality of coils of predetermined size and shape, each of said coils including a plurality of thin elongated metallic conductors, each of said coils having two legs, a portion of each of said legs maintained in position in one of said slots, said apparatus comprising:

(a) frame means including an elongated frame member of predetermined length, said frame member having mounted thereon slidable cable connector means, said slidable cable connector means having cable retaining means affixed to opposite sides thereof;

(b) gripper jaw member means including a pair of gripper jaw arms, each of said gripper jaw arms including a pair of rotating gripper jaws, a first of said gripper jaws mounted proximate one end of a first of said gripper jaw arms, a second of said gripper jaws mounted proximate one end of a second of said gripper jaw arms, torsion means for engaging each of said gripper jaws, said torsion means mounted on each of said arms in working engagement



with said jaws, a hinge means rotatably hinging said first and second gripper arms together at the other ends thereof, gripper arm adjustment means for adjusting the distance between said first and second gripper jaws, quick release pin means for quickly releasing said adjustment means;

(c) first connector means for connecting said gripper jaw member means to said slidable cable connector means;

(d) second connector means, the first ends of which are connected to said slidable cable connector means, a first ring member is included for engagement with the other ends of said second connector means;

(e) a horizontal pulling means is included for pulling said first ring member, whereby when said gripper jaw member means are positioned to contact a coil to be removed from said slots, each of said jaws clamp on one of said coil legs and said apparatus applies a radial pulling force to said coil to avoid binding of said coil in said slots to pull said coil out of said slots, and when said coil is out of said slots, said quick release pin means is pulled to release said coil from said gripper jaws.

4,621,851

SAFETY HOOK

James T. Bailey, Jr., Van Buren, Ark., assignor to United States Forgecraft Corporation, Fort Smith, Ark.

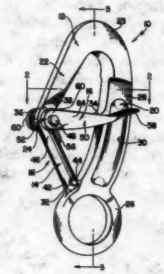
Filed Nov. 27, 1985, Ser. No. 803,095

Int. Cl.[4] B66C *1/36*

U.S. Cl. 294—82.2 **6 Claims**

1. In a safety-hook construction of the type comprising a hook-shaped body having first and second legs which cooperate to define a mouth on said body, and latch means which includes a closure member and a locking member, said closure member being pivotally attached to said first leg and movable between a closed position wherein said mouth is obstructed by said closure member and an inwardly pivoted open position wherein said mouth is at least partially unobstructed, said

locking member being pivotally mounted on said closure member, said locking member having a free end and being biased to a locked position wherein said free end engages the inner edge of said first leg for preventing said closure member from being pivoted inwardly to said open position but being pivotable toward said closure member to an unlocked position to allow said closure member to be pivoted to said open position, the improvement comprising said latch means including thumb tab means on said locking member and extending past the free end



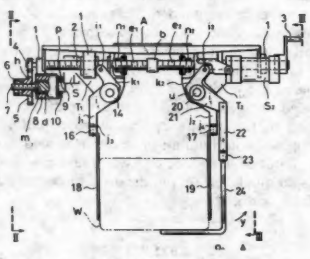
thereof and outwardly along a side of said first leg when said locking member is in the locked position thereof, said thumb tab means being depressible to pivot said locking member toward the unlocked position thereof, said latch means being dimensioned and configured so that when said thumb tab means is depressed to pivot said locking member toward the unlocked position thereof, said closure member is simultaneously and automatically pivoted inwardly toward the open position thereof.

4,621,852

INCHING APPARATUS FOR ROBOT HANDS

Syuichi Maki, Chiyo-machi Yamate Onoda-shi Yamaguchi-ken, Japan

Filed Jan. 14, 1985, Ser. No. 690,986
Claims priority, application Japan, Jan. 30, 1984, 59-13394
Int. Cl.[4] B66C *1/48*
U.S. Cl. 294—86.4 **2 Claims**



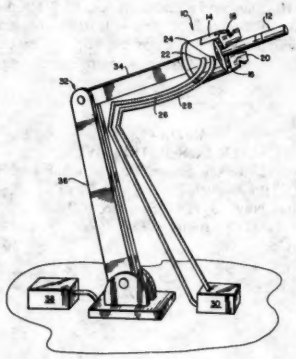
1. An inching apparatus for robot hands comprising a rotary actuator mounted on the robot, a rotational shaft loosely fitted and extended through said rotary actuator, a fastening bolt into which an extreme end portion of the rotational shaft is detachably fitted, a bush threadedly engaged with the fastening bolt, a gear into which said bush is detachably fitted and having a hub threadedly engaged with said fastening bolt, a threaded rod having a gear meshed with the first-mentioned gear secured to one end thereof, a handle mounted on the other end of the threaded rod, a partitioning piece secured approximately in the central portion of said threaded rod, and travelling bodies with scrapers, respectively, which travel in the direction opposite each other on both sides of the partitioning piece.

4,621,853

UNIVERSAL GRIPPER APPARATUS FOR ROBOTIC DEVICE

Anton Fink, Searingtown, N.Y., assignor to Metrology Systems Corporation, Plainview, N.Y.

Filed Nov. 29, 1984, Ser. No. 676,058
Int. Cl.[4] B25J *15/00*
U.S. Cl. 294—88 **4 Claims**



1. A gripper assembly for a robotic device, said assembly comprising:

a generally cylindrical housing having opposed first and second ends, said first end including a generally cylindrical side wall forming a concentrically aligned cylindrical piston cavity extending into the first end of said housing, said second end of said housing including a plurality of pairs of spaced apart parallel jaw guides with each said pair of jaw guides defining a radially aligned jaw channel, the radially innermost portions of said jaw guides defining a concentrically disposed cylindrical actutor channel extending from said second end and into said piston cavity, the diameter of said actuator channel being smaller than the diameter of said piston cavity;

a unitary master jaw pivotally mounted in each said jaw channel, each said master jaw comprising a planar portion disposed intermediate the corresponding pair of jaw guides, a lever arm extending radially inwardly from said planar portion and into the actuator channel the radially innermost portion of each said lever arm defining an arcuate portion spaced from said planar portion and disposed entirely within said actuator channel;

an actuator piston having a circular disc member slidably mounted in said piston cavity and having a cylindrical actuator slidably disposed within said actuator channel, said cylindrical actuator including a generally annular groove disposed in engagement with the arcuate portion of each of said lever arms; and

a rear cover mounted to the first end of said housing and securely covering the piston cavity therein, whereby the longitudinal movement of said actuator piston causes pivotal and radial movement of the arcuate portion of each said lever arm within the annular groove and the simultaneous pivotal movement of the planar portion of each said master jaw within the respective jaw guides of said housing.

4,621,854

DEVICE FOR CHANGING TOOLS IN INDUSTRIAL ROBOTS

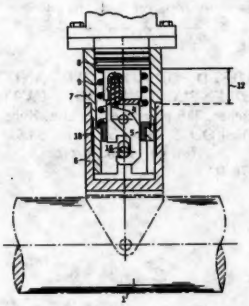
Dieter Boley, Leonberg; Egon Illig, Stuttgart, and Wolfgang Sturz, Sindelfingen, all of Fed. Rep. of Germany, assignors to C. & E. Fein GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 761,914

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433311

Int. Cl.[4] B25J *15/00*

U.S. Cl. 294—88 9 Claims



1. A device for changing tools, pick-ups, welding torches, and other articles that can be handled by industrial robots, comprising: a first part on side of a robot; a second part on side of a tool; closure means having drive means; pivotable spring-loaded hook-shaped means connected to said drive means and movable in axial direction of said drive means; guide means surrounding at least partially said hook-shaped means and movable in direction toward said second part; bolt means attached to said second part and graspable by said hook-shaped means; guide means on said first and second parts; and ejector means on said drive means for separating said parts.

4,621,855

CARRYING HANDLE

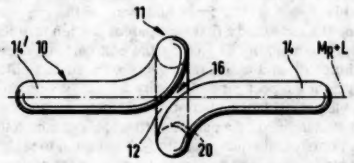
Holgar Kroll, Striepentwiete 21, 2104 Hamburg 92, Fed. Rep. of Germany

Filed Jan. 9, 1985, Ser. No. 689,946

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 3400944

Int. Cl.[4] A47G *25/06*

U.S. Cl. 294—171 6 Claims



1. A carrying handle for at least one carrier bag having a strap-like carrying loop, comprising:

a rod having a center and a longitudinal axis therethrough;

two ends being coaxially aligned on the longitudinal axis of the rod and facing in opposite directions from each other;

an open ring formed in the center of the rod in a plane perpendicular to the longitudinal axis of said rod, said open ring having a central opening therein with a central axis parallel to but spaced from the longitudinal axis of the rod and aligned perpendicular to the plane of the open ring; and

an open transition area, located in the juncture of the open ring and the longitudinal axis of the rod, for allowing the strap-like carrying loop of the at least one carrier bag to be slipped therethrough for hanging from the open ring formed in the center of the rod so that the at least one carrier bag is supported therefrom.

4,621,856

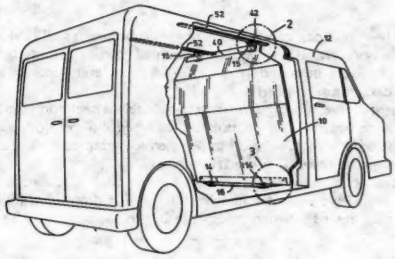
MOUNTABLE AND DEMOUNTABLE PARTITION STRUCTURE FOR MOTOR VEHICLES

William P. McKenzie, Ontario, Canada, assignor to W/S Group Inc., Markham, Canada

Filed Jul. 12, 1985, Ser. No. 754,153

Int. Cl.[4] B60R *27/00*

U.S. Cl. 296—24 R 10 Claims



1. A mountable and demountable partition structure for motor vehicles having a panel adapted to extend substantially from top to bottom and from side to side of the vehicle in which it is mounted;

where said panel is mounted to said vehicle by at least two fastener means extending downwardly through bracket means secured to the bottom of the said panel into co-operating means in the floor of the vehicle, and by at least two fastener means extending upwardly through bracket means secured to the top of said panel into co-operating means in the roof of the vehicle;

where said co-operating means in the floor of the vehicle comprises at least one pair of sideways spaced plates mounted in the floor of the vehicle for co-operating with said fastener means;

and where said panel comprises three panel portions each extending across the width of said panel;

the upper panel portion being tilted forwardly from the vertical when said partition is in its mounted condition;

the middle and upper portions subtending an angle between them of less than 180°;

the middle and lower portion subtending an angle between them of less than 180°;

the lower panel portion being tilted rearwardly from the vertical when said partition is in its mounted condition;

at least the upper and middle panel portions of said panel being made of a solid, translucent material.

4,621,857

MOTOR-VEHICLE TRAILER FOR TRANSPORTING REMOVABLE SUPERSTRUCTURES

Leopold Jägers, Rudolf-Diesel-Str. 1, D-5350 Euskirchen, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,956

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3419026

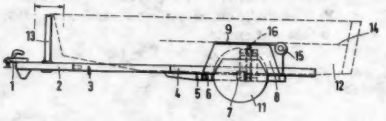
Int. Cl.[4] B62D *23/00*

U.S. Cl. 296—35.3 13 Claims

1. A motor vehicle trailer for transporting removable superstructures having a configuration compatable with said trailer comprising:

a pair of substantially horizontal rail sections, said rail sections being joined at a front end thereof and diverging rearwardly over a first portion of the length of the rail sections, said rail sections extending rearwardly parallel to one another over a second portion of the rail sections to a rear end thereof;

at least first and second transverse sections spaced apart from one another and spanning said rail sections at said second portion thereof;



at least one pair of axle units disposed between said first and second transverse sections, each of said axle units being pivotally mounted at one of said transverse sections and carrying a respective wheel;

a respective wheelguard overlying each wheel and fixed to a respective rail section at said second portion, each wheelguard having an upper surface adapted to act as a support for said superstructures; and

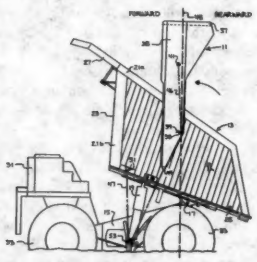
a respective suspension acting between each axle unit and a respective one of said wheelguards for directly transferring the load of said superstructure to each of said wheels.

4,621,858

APPARATUS AND METHOD FOR A ROTATABLE TAILGATE ASSEMBLY HAVING SERVICE AND OUT-OF-SERVICE POSITIONS

LeRoy G. Hagenbuch, 4602 N. Rosemead, Peoria, Ill. 61604

Filed Sep. 28, 1984, Ser. No. 656,078
Int. Cl.[4] B60P *1/26*
U.S. Cl. 296—56 **8 Claims**



1. A subassembly for the pivotal body of a heavy-duty truck wherein the body is supported by a truck frame and includes opposing side walls, a front wall and a canopy extending forward from the front wall over the cab of the truck, said subassembly comprising in combination;

a tailgate assembly including opposing side beams attached at their first ends to a tailgate;

pivot means coupling said opposing side beams to said opposing side walls such that said tailgate assembly can be rotated about an axis of rotation intersecting both side walls, said axis of rotation intersecting a vertical plane which divides said truck body into forward and rearward sides;

said tailgate assembly having a center of gravity intermediate said tailgate and said axis of rotation;

means for rotating said tailgate assembly about said axis of rotation from a service position to an out-of-service position in which said tailgate assembly rests on the canopy of said body; and

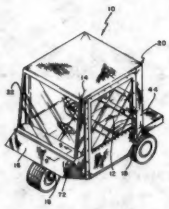
said rotating means includes a cable or chain connected to said truck body at a first end, to said tailgate assembly at its second end and biased against a roller assembly mounted to said truck frame at a cable or chain location intermediate said first and second ends whereby movement of said truck body from lowered to raised positions draws said cable or chain in a first direction causing said tailgate assembly to rotate about its axis of rotation and subsequent movement of said truck body from raised to lowered positions draws said cable or chain in a direction opposite said first direction causing said tailgate assembly to continue rotating about its axis of rotation until said tailgate assembly rests on said canopy.

4,621,859

WEATHERSHIELD FOR GOLF CART AND A METHOD OF ENCLOSING A GOLF CART

Kenneth N. Spicher, 325 Fairway, Wichita, Kans. 67212

Filed Oct. 9, 1984, Ser. No. 658,675
Int. Cl.[4] B60J *9/00*
U.S. Cl. 296—78 R **2 Claims**



1. A weathershield means for use on golf carts, or the like, of the type having a passenger compartment comprising in combination a pipe frame means mounted on said golf cart, said pipe frame means having a roof defined by a front pipe, a back pipe, a pair of side pipes secured to the front pipe and the back pipe, a pair of front upright support pipe members mounted on the golf cart and secured to said roof in close proximity to the juncture of the front pipe with the pair of side pipes, and a pair of rear upright support pipe members mounted on the golf cart and secured to the roof in close proximity to the juncture of the back pipe with the pair of side pipes; a first sheet of flexible, water repellent material means in a configuration including a top wall having outer dimensions at least equal to the outer dimensions of said roof of the pipe frame means, a front and a rear wall depending downwardly from the outer edges of the top wall portion and being of sufficient length to respectively detachably fasten to the front and rear of the golf cart for enclosing the same, and a first transparent portion in at least the front wall for visibility in guiding the golf cart; a pair of door means hingedly and easily removably secured to said pair of front upright support pipe means by hinges having an easily retractable pin, each of said door means comprising a door pipe frame means defined by a pair of vertical pipe means, a top and a bottom horizontal pipe means integrally bound to said pair of vertical pipe means, and a cross brace pipe means connected to said pair of vertical pipe means, each of said door means further comprises a second sheet of flexible, water repellent material means depending from and detachably secured to the outer edges of said door pipe frame means, and a second transparent portion included within the second sheet of material means for each of said two door means for visibility; each of said second transparent portion extends from the top horizontal pipe means to the cross brace pipe means;

a pair of windshield pipe means secured to and depending downwardly from the front pipe of said roof and connected to and supported by the front of the golf cart;

the outer dimensions of said first transparent portion is the perimeter generally defined by the length of said front

pipe of said roof, the length of said pair of said pipe windshield means, and the distance separating said pair of pipe windshield means at their point of attachment to the front of the golf cart;

each of said two rear upright support pipe members includes a hook means and each of said door means additionally comprises a latch means secured to one of the vertical pipe means of said door pipe frame means for removably securing the pair of door means to the pair of rear upright support pipe members; a lug means integrally bound to said first material means; and a fastener means traversing the entire front of the golf cart in order to fasten the first sheet of flexible, water repellent material means to the front of the golf cart, said fastener means comprising a vertical cross section being generally elliptical with an opening to receive the lug means of the first material means.

4,621,860

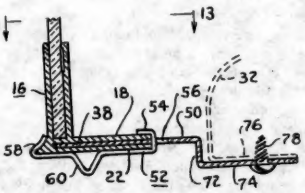
WIND DEFLECTOR AND BUG SCREEN

Louie H. Gerst, 815 Miramar St., Cape Coral, Fla. 33904

Filed Jun. 25, 1984, Ser. No. 624,252

Int. Cl.[4] B60K *11/02*

U.S. Cl. 296—91 **8 Claims**



1. A wind deflector for a motor vehicle comprising an elongated extruded support member adapted to be secured transversely to the front of the vehicle, an acrylic wind deflector secured to the extruded support member and extending upwardly therefrom, the extruded member having a forwardly extending contoured nose portion adjacent the bottom of the extruded member and extending the full length of the extruded member to initiate the upward deflection of air over the wind deflector, and a clip releasably connected to the nose portion to secure the support member to the vehicle.

4,621,861

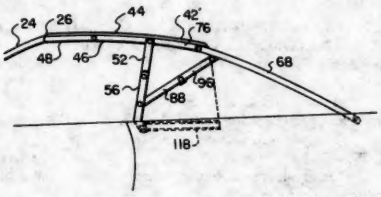
CONVERTIBLE TOP FOR AUTOMOBILES

Onofrio Scaduto, 1623 S. 56th Ct., Cicero, Ill. 60650

Filed Feb. 19, 1985, Ser. No. 702,914

Int. Cl.[4] B60J *7/12*

U.S. Cl. 296—118 **18 Claims**



1. A convertible top structure foldable for storage into a compact space comprising:

a support bow comprising a cross member having a pair of legs, each leg having a hinge intermediate the ends thereof, said bow pivotally mounted for extending into an upright support position and said legs are each foldable about one-hundred eighty degrees about said hinge for collapsing into a retracted position for stowage in a space; and

collapsible supporting linkage disposed rearward of said support bow for supporting said bow in the upright support position, and comprising a pair of elongated first link members each having an outer end for pivotal attachment to an automobile chassis and an inner end pivotally connected by a respective second link to said bow, and a pair of toggle linkages, each linkage connected at one end to said bow and at the other end to the inner end of said elongated first links.

4,621,862

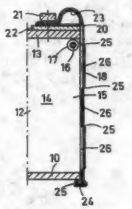
CLOSING MEANS FOR TRUCKS

Thomas Kramer, Krefeld, Fed. Rep. of Germany, assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 22, 1984, Ser. No. 663,245

Int. Cl.[4] B60J *5/06*

U.S. Cl. 296—183 **4 Claims**



1. Closing means for a truck having a load compartment with at least two vertical members a horizontal ceiling member and a horizontal floor member defining an opening comprising:

a tarpaulin secured along a substantial portion of its upper end to the horizontal ceiling member;

means disposed along substantially the entire length of the lower end of said tarpaulin for securing the lower end of said tarpaulin to the horizontal floor member;

means coupled to the tarpaulin for upwardly folding the tarpaulin; and

an inflatable cushion disposed between the ceiling member and the tarpaulin; and

means for inflating the cushion when the tarpaulin is secured to the horizontal floor member, whereby the tarpaulin is placed under tension in the vertical direction.

4,621,863

RECLINING CHAIR HAVING A DETACHABLE LEG REST

W. Ronald Jackson, Cleveland, Tenn.; Albert J. Kraus, and Wesley E. Lerdon, both of Columbus, Ohio, assignors to Cleveland Chair Company, Cleveland, Tenn.

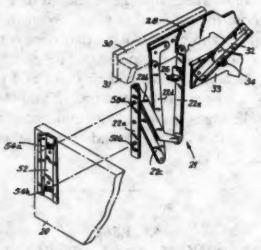
Filed Jan. 17, 1986, Ser. No. 819,582

Int. Cl.[4] A47C *1/035, 7/52*

U.S. Cl. 297—85 **5 Claims**

1. A reclining chair comprising a stationary frame; a movable seat/back occupant support; a leg rest; means for tilting said seat/back occupant support backwards and for extending said leg rest upward and outward, said tilting and extending means including a pair of leg rest extender linkage means, one on each side of the chair; first mating means at the end of each of said leg rest extender linkage means; and second mating means on each end of said leg rest each of which detachably secures said leg rest to a respective one of said first mating

means; the force required to disengage said first and second means from each other being less than that which would normally cause serious injury to a person who interferes with retraction of said leg rest.

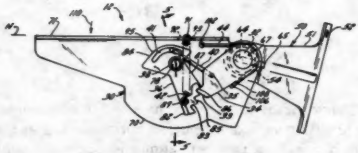


4,621,864

TILTABLE ARM REST ASSEMBLY AND MOUNTING AND OPERATING MEANS THEREFOR

Kevin E. Hill, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Dec. 13, 1984, Ser. No. 681,444
Int. Cl.[4] A47C 7/54
U.S. Cl. 297—115 **2 Claims**



1. A component assembly mountable on a support and pivotally movable thereon between angularly spaced apart first, second and third positions, said component assembly comprising:

a member;

mounting means on said member for mounting said member on said support for pivotal movement between said positions, said mounting means comprising a pivot shaft attachable to said support and said member being pivotally mounted on said pivot shaft;

and operating means on said member, said operating means comprising:

a pawl rigidly mounted on said pivot shaft;

a latch pivotally mounted on said member and engageable with said pawl;

an overcenter spring connected between said length and said member, said overcenter spring being operable to maintain engagement of said pawl and said latch when said member is moved from first to second position;

and a connecting rod connected between said pawl and said latch, said connecting rod effecting disengagement of said latch and said pawl and effecting overcenter movement of said overcenter spring when said member is moved from second to third position and said connecting rod effecting opposite overcenter movement of said overcenter spring when said member is moved to first position;

said operating means being actuatable by pivotal movement of said member in one direction from first to second positions to releasably lock said member in said second position and prevent movement thereof in a direction opposite to said one direction;

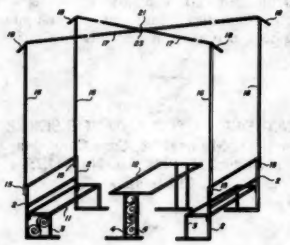
said operating means being further actuatable by pivotal movement of said member in said one direction from second to third position to release said member from said second position and enable pivotal movement thereof in said opposite direction from said third position, through said second position, to said first position.

4,621,865

DEMOUNTABLE PATIO FURNITURE

Fernando Q. Herrera, 1118 Porter St., San Antonio, Tex. 78210

Filed Aug. 14, 1984, Ser. No. 640,746
Int. Cl.[4] A47B 39/00, 37/04
U.S. Cl. 297—157 **5 Claims**



1. An easily assembled combination of a stable rectangular table having four corners and two rectangular seats, each seat having four corners and each seat being parallel in the lengthwise direction with the table, the combination having a single square or rectangular tubular horizontal support, a flat side of which engages the surface upon which the assembled combination is placed, for each lengthwise end of the table and the two rectangular seats, two coplaner upright hollow metal supports having a square or rectangular cross section integral with each horizontal support for supporting a table top and two coplaner upright hollow metal supports each having a square or rectangular cross section integral with each horizontal support for supporting each seat, said upright supports permanently attached to each horizontal support, hollow sockets each having a square or rectangular cross section positioned at seat height in each of the seat supports, seat attachment means consisting essentially of downward extending posts, each having a square or rectangular cross section, permanently attached to the corners of the seats which nest into the hollow metal sockets at seat height and table top attachment means consisting essentially of downward extending posts, each having a square or rectangular cross section, permanently attached to the corners of the table top, which posts nest tightly into the hollow metal supports at table height, the easily assembled combination being entirely free of bolts, screws or any other additional fastening means for the assembling or disassembing the combination other than the posts and sockets.

4,621,866

ARMCHAIR STRUCTURE HAVING AN ADJUSTABLE ANATOMICAL CONFIGURATION

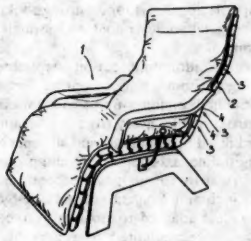
Giuseppe Zani, Via Enrico Toti, 13, 20039 Varedo (Milano), Italy

Filed Jul. 31, 1985, Ser. No. 760,954
Claims priority, application Italy, May 17, 1985, 21854/85[U]
Int. Cl.[4] A47C 3/00
U.S. Cl. 297—284 **1 Claim**

1. An armchair structure having an adjustable anatomical configuration, comprising:

a supporting framework having a stringer assembly along each side, each said stringer assembly being constituted by a plurality of interconnected articulation elements, each said articulation element being shaped at one end to form a first connector portion and at the other end to form a second connector portion, said first connector portion of one articulation element being connectable to said second

connector portion of an adjacent said articulation element in a said stringer assembly said connection between adjacent pairs of said articulation elements allowing said articulation elements to be disposed at a selected relative inclination with respect to one another, each said articulation element including a flattened elongate plate part which is formed at its ends with said first and second connector portions, each of said first and second connector portions having a central aperture passing therethrough and a plurality of serrations formed on one face thereof, said serrations extending radially outwardly from said aperture and said serrations of said first connector portion being formed on one face of said plate whilst said serrations of said second connector portion being formed on the opposite face of said plate such as to allow face-to-face coupling of said first and second connector portions of adjacent said articulation elements, said connector portion being defined by two substantially circular end portions which occupy the main part of said plate, said radial serrations being recessed and a grooved not serrated portion being formed encompassing a part of the circumpherential contour of each said end portion toward the central portion of said plate, said two end portions being arranged at a distance substantially corresponding to a radius of a said circular end portion, cooperating said connector portions of adjacent said articulation elements being secured together by a clamping bolt passing through said apertures in said connector portions whereby to fix said connector portions together with said facing serrations thereof in engagement with one another, each said articulation element having a cross member sleeve shaped connector formed in a single piece therewith and extending from a mid portion thereof, for connection to a respective cross member of a set thereof joining said two lateral stringer assemblies together, said cross member connector extending from a median zone of said flat plate part in a direction substantially perpendicular to the plane in which said flat plate part lies, substantially parallel to the axes of said apertures in said connector portions, the width of said cross member connector spanning substantially from the center of one said end portion to the center of the other.



4,621,867
EASY ENTRY SEAT ADJUSTER

John Perring, Sterling Heights, and William J. Watkinson, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 4, 1985, Ser. No. 720,370
Int. Cl.[4] B60N *1/04*
U.S. Cl. 297—341 **8 Claims**

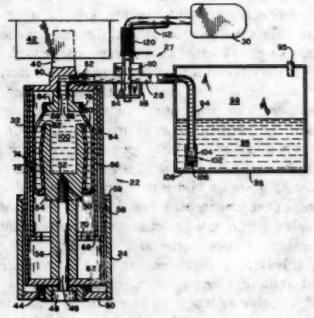
1. An easy entry seat adjuster comprising, in combination, a pair of track members, means slidably mounting one track member on the other track member for longitudinal adjustment relative thereto, one track member having an opening therein and the other track member having a plurality of openings therein, each pairable with the opening of the one track member to define a horizontally adjusted position of the track members, a latch carrier slidably mounted on the track members, latch means movably mounted on the carrier for movement in a plane longitudinal of the track members and including a pair of latch arms extending oppositely of each other, one latch arm being movable into and out of the opening of the one track member and the other latch arm being movable into and out of each of the openings of the other track member, means interconnecting the carrier and the latch means and normally locating the latch means with one latch arm extending into the one opening and the other latch arm extending into a paired opening of the other track member to releasably latch the track members to each other in a longitudinal adjusted position, means moving the latch means relative to the carrier to move the one arm further into the one opening as the other latch arm moves out of the opening of the other track member to permit

movement of the one track member, the carrier and the latch means as a unit relative to the other track member to a new adjusted position relative thereto, the reengagement of the other latch arm in another opening of the other track member releasably latching the track members to each other in the new adjusted position, and means for moving the latch means relative to the carrier to move the other latch arm further into the opening of the other track member as the one latch arm moves out of the opening in the one track member to permit movement of the one track member relative to the other track member, the carrier and the latch means from an initial starting position to an easy entry position, return of the one track member to the initial starting position reengaging the one latch arm in the opening of the one track member to releasably latch the one track member to the other track member in the initial starting position.

4,621,868
HEIGHT CONTROL MECHANISM

Mathew A. Slaats, and Patrick E. Strange, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Continuation-in-part of Ser. No. 668,307, Nov. 5, 1984. This application Sep. 6, 1985, Ser. No. 773,337
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—347 **17 Claims**



1. A fluid operated height adjustment mechanism for an article of furniture comprising:

a base;

a first reservoir having a pressurized gas therein;

a second reservoir comprising a flexible wall and being filled with a substantially incompressible liquid, the volume of said second reservoir being variable and said second reservoir being supported by said base;

a telescoping support member mounted on said second reservoir and movable between extended and retracted positions in response to variations in said variable volume;

flexible conduit means connecting said first reservoir to said second reservoir to permit liquid flow between said reservoirs; and

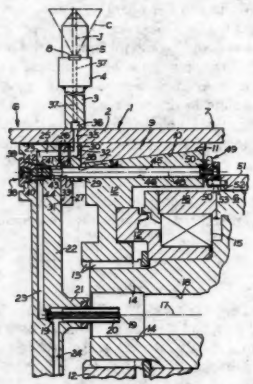
control means for selectively controlling the flow of fluid between said first and second reservoirs, said control means including actuating means for actuating a pivotable closure means, said closure means normally pinching said conduit closed, said actuating means operable for selectively causing said closure means to open said flexible conduit and enabling liquid flow through said conduit.

4,621,869

ROTARY CUTTING HEAD

George A. Parrott, Wakefield, England, assignor to Minnovation Limited, Wakefield, England

Filed Mar. 7, 1985, Ser. No. 708,976
Int. Cl.[4] E21C *35/22*
U.S. Cl. 299—81 **16 Claims**



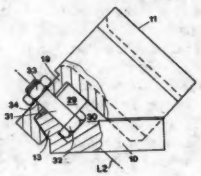
15. A rotary mineral winning/rock cutting assembly comprising; a cutting head of the type for mounting to a ranging arm of a mineral winning machine, wherein said cutting head is rotatable relative to said ranging arm; and an abutment arrangement fixedly mounted on said ranging arm, said cutting head comprising, a plurality of water discharge nozzles; at least one water supply conduit to convey, in use, pressurized water to said discharge nozzles, valve means associated with said conduit to permit or prevent a flow of water along said conduit, to achieve phased water control, with water to be discharged from said nozzles when located in, or adjacent, a rock segment to be cut in the course of rotation of said cutting head, and no discharge from said nozzles when located in, or adjacent, a non-cut segment, each of said valve means comprising a rotary valve member, with an actuator shaft operable on said valve member to rotate the latter through "on" and "off" positions, at least one arm extending radially from said actuator shaft; said abutment arrangement engaging said at least one arm upon relative rotation of the cutting head to produce rotation of said actuator shaft and hence to produce rotation of said at least one rotary valve member to operate said at least one valve member between an "on" or an "off" position and thereby achieve phasing of the supply of water to the discharge nozzles of said cutting head.

4,621,870

SUPPORT FOR A CUTTING TOOL FOR CUTTING HARD MATERIAL

Bert G. Levefelt, Mariestad, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

Filed May 8, 1985, Ser. No. 731,879
Claims priority, application Sweden, May 21, 1984, 8402716
Int. Cl.[4] E21C *35/18*
U.S. Cl. 299—91 **10 Claims**



1. A tool support apparatus for a cutting tool of the type for cutting hard material such as coal and asphalt, said support apparatus comprising:

a base including a mounting section adapted for securement to a cutting machine, said mounting section carrying a projection which includes first surface means converging in a forward direction away from said mounting section, a slit formed in said projection, said slit opening laterally of a first longitudinal axis defined by said projection and also opening forwardly through said projection,

a tool holder including first and second side-by-side recesses, said first recess adapted to removably receive said tool, said second recess adapted to removably receive said projection,

said first and second recesses being spaced apart in a direction which is lateral relative to a second longitudinal axis defined by said second recess,

said second recess comprising a socket open at one longitudinal end thereof and including a tongue overlying an opposing longitudinal end thereof, said tongue including a through-hole extending completely through said tongue in a direction generally parallel to said second longitudinal axis, said socket including second surface means converging in a direction away from said open end thereof and arranged to wedgingly engage said first surface means of said projection, and

a fastener sized to be laterally inserted into said projection through said slit and to extend forwardly along said firsrt and second axes and through said through-hole for removably securing said projection within said socket.

4,621,871

QUICKLY REPLACEABLE CUTTER SOCKET

C. Ranjan Salani, Springfield, Ohio, assignor to Koehring Company, Milwaukee, Wis.

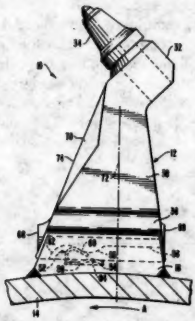
Filed Jun. 19, 1985, Ser. No. 746,350
Int. Cl.[4] E21C *25/12*
U.S. Cl. 299—91 **17 Claims**

1. Apparatus for removably mounting a cutter on a support for movement in a predetermined direction to cut a work surface, comprising:

a socket for receiving the cutter, and a receptacle secured to the movable support for receiving the socket, said receptacle having means for defining a tapered channel having a longitudinal axis generally parallel to said predetermined direction of cutter movement,

wherein said means for defining a tapered channel comprises a base surface and lateral surfaces defining an angle with the longitudinal axis of said tapered channel and being oriented at an acute angle with respect to said base surface,

said socket has mating surfaces engaging and parallel to said base surface and said lateral surfaces of the tapered channel, whereby pitching, rolling and yawing of said socket relative to said receptacle are prevented, and



said base surface is parallel to said predetermined direction of cutter movement, whereby the distance between said cutter and said support is constant regardless of the extent of insertion of said socket into said receptacle.

4,621,872

WHEEL TREAD ADJUSTING APPARATUS

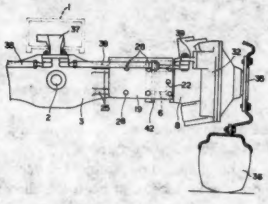
Toshiyuki Yotsumoto, Kishiwada, and Tomeo Umemoto, Osaka, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 23, 1985, Ser. No. 726,209

Claims priority, application Japan, Jul. 26, 1984, 59-114741[U]

Int. Cl.[4] B60B *36/18*

U.S. Cl. 301—124 H 7 Claims



1. A wheel tread adjusting apparatus for a vehicle having a main axle case supported by a vehicle body and slidable cases mounted in right and left ends of the main axle case and carrying ground engaging wheels, respectively, the slidable cases being slidable transversely of the vehicle toward and away from each other, said apparatus comprising for each of said slidable cases a fixing plate extending transversely of said vehicle and being unrotatable relative to the main axle case, and locking means to permit the fixing plate to fix the main axle case and the slidable case in any of a plurality of positions relative to each other.

4,621,873

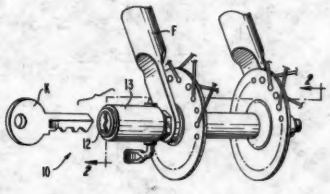
QUICK RELEASE ASSEMBLY WITH INTEGRAL LOCK

Mark F. Weinstein, 99 Old Stamford Rd., New Canaan, Conn. 06840, and Craig H. Yerkes, 27 Lyman St., Springfield, Mass. 01106

Filed May 17, 1985, Ser. No. 735,093

Int. Cl.[4] B62K *25/02;* B62H *5/00*

U.S. Cl. 301—124 R 7 Claims



1. A bicycle wheel quick release assembly for securing the wheel to the fork of a bicycle frame comprising:

a central mounting shaft having a first end threaded to receive locking nuts and an end cap and a second end formed of a cylindrical shaft extension having a transverse bore therein;

cylindrical housing means including a first chamber having an opening to receive said cylindrical shaft extension for reciprocal movement therein, and a second chamber having an opening to receive a locking mechanism including a locking pin;

drive means, including a rotatable lever and eccentric drive shaft, said eccentric drive shaft having a transverse bore therein adapted to receive said locking pin, said eccentric drive shaft being rotatably mounted within said shaft extension transverse bore for longitudinally moving said central mounting shaft and said shaft extension relative to said bicycle frame fork for loosening and tightening said assembly relative to said fork;

said locking pin being in communication with said eccentric drive shaft whereby, in use, said locking pin is selectively moveable to engage and disengage said drive shaft transverse bore of said eccentric drive shaft to prevent and permit rotational movement thereof respectively, in turn preventing and permitting longitudinal movement of said central mounting shaft relative to said bicycle frame fork.

4,621,874

VEHICLE THEFT-PREVENTING DEVICE ACTING ON THE BRAKE SYSTEM

Jan Gustafsson, Öregrundsgatan 7, Stockholm, Sweden (S-115 41)

PCT No. PCT/SE84/00054, § 371 Date Oct. 16, 1984, § 102(e) Date Oct. 16, 1984, PCT Pub. No. WO84/03263, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 14, 1984, Ser. No. 667,498

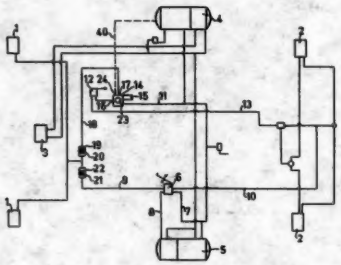
Claims priority, application Sweden, Feb. 18, 1983, 8300922

Int. Cl.[4] B60T *17/00*

U.S. Cl. 303—89 5 Claims

1. A device for preventing the theft of vehicles and trailers, the deceleration brakes and parking brake of which are brakes operated with pressure medium, and which include at least two wheel pairs, a decelerating brake circuit, and a foot-operated decelerating brake valve, comprising a valve controlled by a code lock; said valve being a three-way valve having one inlet port and two outlet ports; said valve being disposed in a feed line between a pressure medium source for actuating the parking brake and a control valve for the parking brake; said inlet port of said outlet ports being connected to said control valve, and the second one of said outlet ports being connected to the decelerating brake circuit for either one of the wheel pairs via a first check valve; a feed line from the foot-operated decelera-

tion brake valve comprising a second check valve; by the locked position of a code lock, maintained in a first position, wherein the connection between said inlet port and said one of said outlet ports, is closed while maintaining the connection between said inlet port and said second one of said outlet ports open; and vice versa in a second, open position of said code



lock, the line between said three-way valve and said first check valve being relieved of pressure when said code lock assumes said open position: said three-way valve including a pressure relief opening which is maintained in connection to said second outlet port of said valve body of said three-way valve when said valve body closes the connection with said inlet port and said second outlet port.

4,621,875

BALL BUSHING

Denis Borel, Wallisellen, Switzerland, assignor to SRO Kugellagerwerke J. Schmidt-Roost AG, Switzerland

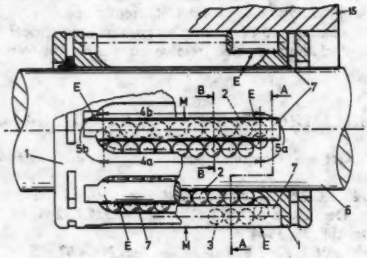
Filed Jan. 15, 1985, Ser. No. 691,670

Claims priority, application European Pat. Off., Feb. 13, 1984, 8410151.7

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.[4] F16C *29/06*

U.S. Cl. 384—45 **11 Claims**



1. A ball bushing for mounting around a shaft, comprising:

a cylindrical sleeve of a deformable material for fitting around a shaft having a center axis, the sleeve having a plurality of closed channels defined therein, each closed channel including first and second axially extending portions extending generally parallel to the center axis of the shaft between first and second ends and first and second curved portions disposed at the first and second ends, respectively, each curved portion connecting the first and second axially extending portions together, the second axially extending portion being arranged in a direction of rotation about the center axis of the shaft from the first axially extending portion;

a plurality of balls in the closed channel for providing a row of load-bearing balls in the first axially extending portion and a row of non-load-bearing balls in the second axially extending portion; and

a plurality of steel needles, each having a respective center axis extending generally parallel to the center axis of the shaft, each steel needle being positioned directly adjacent and at least partially engaging the load-bearing balls in a respective one of the closed channels such that the lines connecting the center point of each load-bearing ball to the center axis of the shaft and to the center axis of the respective steel needle form a respective angle with a vertex pointing in the direction of rotation, each of the respective angles being less than 180° and greater than 170°.

4,621,876

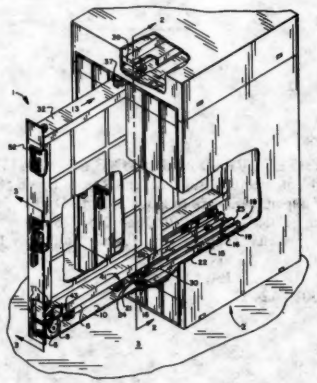
EQUIPMENT DRAWER SUPPORT

William A. Reimer, Wheaton, Ill., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Sep. 13, 1985, Ser. No. 775,899

Int. Cl.[4] A47B *91/00*

U.S. Cl. 312—250 **12 Claims**



1. A support for an equipment drawer, said support comprising:

an equipment frame mounted to a supporting surface;

a band roller attached to said drawer;

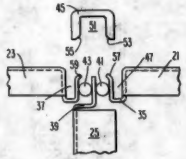
a band of flexible material positioned between said roller and said supporting surface, said band attached to said equipment frame via a first end and including a second end, said first end attached to said equipment frame to anchor and position said band relative to said equipment frame, said roller bearing against said band to support said drawer in rolling movement and said band adapted to provide a rolling surface for said band roller, to prevent said roller from directly contacting said supporting surface, and to engage said supporting surface while protecting said supporting surface from damage; and

an elastic means connected between said drawer and said band second end, said elastic means taking up slack in said band when said drawer is rolled into a retracted position within said equipment frame.

4,621,877
SECURING CABINET WALLS

Ronald B. Boudreau, Westford, Mass., and Charles F. Termini, Hampton Beach, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 1, 1984, Ser. No. 636,862
Int. Cl.[4] A47B *45/00*
U.S. Cl. 312—257 R **4 Claims**



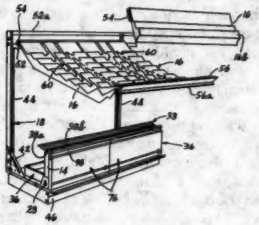
1. A securing arrangement for securing a horizontally oriented wall of a cabinet with a vertically oriented wall of a cabinet and for alternatively enabling said horizontally oriented wall to be readily separated from said vertically oriented wall and wherein said horizontally oriented wall and said vertically oriented wall each have at least one horizontally oriented edge, comprising in combination: extensions means secured to and disposed to lie along said horizontally oriented edge of said vertically oriented wall, said extension means formed to extend vertically from said last mentioned horizontally oriented edge; groove member means secured to, and disposed to lie along, said horizontally oriented edge of said horizontally oriented wall, said groove member means having a groove therein; said extension means and said groove member means each having a facing surface disposed in close proximity to one another and each having an outside surface lying away from its respective said facing surface; resilient means, having a compressed state and an uncompressed state, disposed to fit between said facing surfaces of said extension means and said grove member means whereby in it uncompressed state it separates said outside surfaces respectively of said extension means and said groove member means from one antoher by a first distance and whereby in its compressed state it provides an outward force; compression strip means formed to have a channel therein which is substantially U shaped and wherein the distance across said channel is smaller than said first distance, said compression means disposed vertically over said extension means and said groove member means to force said extension means and said groove member means against said resilient means to squeeze said resilient means into its compressed state whereby the outward force of said resilient means causes said compression strip means as well as said extension means and said groove member means to be secured together and whereby said compression strip means is readily removable vertically in response to compressing said resilient means thereby enabling said extension means and said groove member means to be readily separated.

4,621,878
KNOCK-DOWN MERCHANDISE DISPLAY FIXTURE

John A. Johnson; Edward O. Gandolf, both of Strongsville, and Stephen N. Hardy, Copley, all of Ohio, assignors to American Greetings Corporation, Cleveland, Ohio

Filed Mar. 11, 1985, Ser. No. 710,430
Int. Cl.[4] A47F *3/14*
U.S. Cl. 312—257 R **22 Claims**

1. In a knock-down merchandise display fixture comprising a base having a pair of forwardly disposed generally vertically extending laterally spaced arms mounted in coupled relation to said base adjacent the forward boundary of the base and extending upwardly relative to said base, and a removable merchandise display deck adapted for receiving merchandise thereon, and having an upper end and a lower end, said arms being adapted to provide structural support for said merchandise display deck of said fixture, and means coacting between said arms and said base providing for selective folding of said arms relative to said base for decreasing the overall height of said base and arms for facilitating shipment of said fixture, a cross member supported on said arms and extending transverse of said base and between said arms, to define the generally

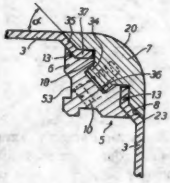


forward boundary of said fixture, and means on said cross member coacting with said lower end of said deck and providing structural support in detachable relation for said lower end of said merchandise display deck of said fixture relative to said arms and said cross member, to enable said selective folding of said arms relative to said base.

4,621,879
BOX-LIKE FURNITURE STRUCTURE

Walter Schneider, Langnau, Switzerland, assignor to W. Schneider & Co. AG Metallwarenfabrik, Langnau, Switzerland

Filed Jul. 2, 1984, Ser. No. 626,710
Claims priority, application Switzerland, Jul. 5, 1983, 3686/83
Int. Cl.[4] A47B *47/03*
U.S. Cl. 312—258 **20 Claims**



1. Box-like furniture structure, particularly wardrobe or cabinet, having

an end wall (2);

four side walls (3) extending perpendicularly to the end wall to define a structure having an open side;

and corner connecting elements (5) for connecting together adjacent side walls in right-angle position,

wherein

the side walls (3) are formed with

unitary longitudinal edge portions (13) extending perpendicularly to the end wall and at an angle in relation to the respective side wall,

wherein the side walls comprise U-shaped channels (57) located at the open side of the side walls, extending parallel to the end wall and remote therefrom,

said U-shaped channels being defined by an essentially flat connecting portion (55), edges delimiting the connecting portion, an end region of the respective side wall, and an inner portion (4), said inner portion extending essentially in a direction toward the end wall, the inner portions (4) of the U-channels of adjacent side walls being located adjacent each other and forming a corner;

the connecting elements (5) comprise

elongated rail elements having an outer portion facing the

outside of the structure and an inner portion inside the structure;

the connecting elements being formed with two receiving grooves (8) and extending in longitudinal direction of the respective connecting element, each groove being shaped and dimensioned to receive and fit therein the edge portions (13) of the side walls (3) and forming the corners of the furniture structure,

the inner portion having an outer surface region, located adjacent the outer portion, which is recessed with respect to the outer surface (20) of the outer portion;

wherein a head element (40) is provided above each connecting element (5) covering the receiving grooves (8),

said head element having, in cross section perpendicular to the side wall, approximately quarter-circle shape, and positioned for covering the receiving grooves (8) at said top portion of the connecting element, and located adjacent an end portion of the connecting element,

and wherein the outer surfaces (20) of the corner connecting elements (5) are flush with the side walls adjacent said connecting elements.

4,621,880

ELECTRICAL CONTACT ELEMENTS, CONNECTORS AND ASSEMBLIES

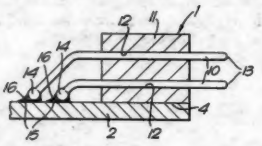
Derek A. Rush, London, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Jun. 28, 1985, Ser. No. 749,856

Claims priority, application United Kingdom, Jul. 11, 1984, 8417646

Int. Cl.[4] H01R *9/09*

U.S. Cl. 339—17 LC **10 Claims**



1. An electrical connector assembly comprising an electrical connector and a circuit board, the said connector including a housing mounted on one surface of said circuit board and at least one electrical contact element having one end supported in said housing, the said contact element projecting from said housing and comprising a metal wire of substantially circular cross-section along the major part of its length projecting from said housing, said contact element having an enlarged portion of substantially spherical shape at its other end, and the said circuit board having one or more respective substantially flat electrical contact pads on said one surface, each said respective contact pad being contacted by and soldered to the said enlarged portion at the other end of the or each contact element.

4,621,881

CONNECTION DEVICE IN AN IGNITION SYSTEM

Sven H. Johansson, and Jan G. Nytomt, both of Åmål, Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

PCT No. PCT/SE84/00244, § 371 Date Apr. 2, 1985, § 102(e) Date Apr. 2, 1985, PCT Pub. No. WO85/00931, PCT Pub. Date Feb. 28, 1985

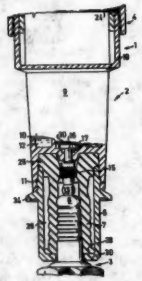
PCT Filed Jun. 28, 1984, Ser. No. 719,273

Claims priority, application Sweden, Aug. 5, 1983, 8304282

Int. Cl.[4] H01R *13/44*

U.S. Cl. 339—26 **7 Claims**

1. Connection device in an ignition system for transferring current to the spark plugs of an internal combustion engine, each connection device (5) including a comparatively rigid outer sleeve (6) intended to surround an upper portion (8) of a spark plug, a contact means for conductive communication with a central electrode (13) of the spark plug, an elastic inner sleeve (7) surrounded by the outer sleeve (6) for tightly sealing against the upper portion (8) of the spark plug when the connection device (5) is fitted to the spark plug (3), a space (26) being formed between the outer sleeve (6) and the inner sleeve (7) for allowing radial expansion of the inner sleeve (7), characterized in that the outer sleeve (6) and the inner sleeve (7) have lower portions which include coacting portions for transferring force between the outer and inner sleeves (6,7), whereby for an upwardly directed force on the connection device (5) fitted to the spark plug, force is transferred from the outer sleeve to the inner sleeve (7), and causes the inner sleeve to relinquish the spark plug.



4,621,882

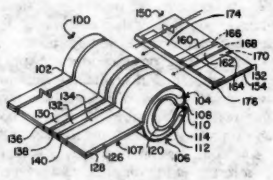
THERMALLY RESPONSIVE ELECTRICAL CONNECTOR

John F. Krumme, Woodside, Calif., assignor to Beta Phase, Inc., Menlo Park, Calif.

Continuation of Ser. No. 609,747, May 14, 1984, abandoned. This application Nov. 26, 1985, Ser. No. 801,516

Int. Cl.[4] H01R *13/20*

U.S. Cl. 339—30 **11 Claims**



1. An electrical connector comprising:

a first strip having an axially elongated hollow split tube having an axially aligned split therein to receive a substrate forming one edge thereof;

a heat recoverable member being a concentric layered portion of said tube to change the radial dimensions of said split, said member formed from shape memory metal having a deformable state below a transition temperature and a memory state above the transition temperature, said member capable of being deformed when said metal is in its deformable state corresponding to one dimension of the split, a change from its deformable state to its memory state recoverying said member to its non-deformed shape corresponding to another dimension of the split;

spring means also being a concentric layered portion of said tube in operative co-axial contact with said heat-recoverable member, said spring means and said heat-recoverable member providing unobstructed access to the axis of said

hollow split tube to a substrate that may be inserted therein, said spring means contacting and exerting a radial force against said heat-recoverable member to deform said heat-recoverable member when said metal is in its deformable state, said heat-recoverable member capable of overcoming said force when said metal is changed from its deformable state to its memory state, recovering to its non-deformed shape to change the dimension of said split; and

a plurality of parallel spaced conductors extending along said first strip and extending generally perpendicular to the axis of said split tube and exposed along the inner surface of said split tube, said conductors terminating at a plurality of corresponding contacts, said contacts capable of making electrical contact with the substrate that may be inserted in the split of said split tube.

4,621,883

ELECTRICAL CONNECTOR ASSEMBLY

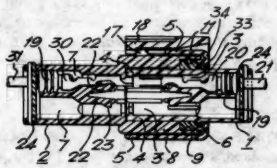
Masaro Noguchi, Sagamihara, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 484,053, Apr. 11, 1983, abandoned. This application Jan. 27, 1986, Ser. No. 824,295

Claims priority, application United Kingdom, Apr. 14, 1982, 8210774

Int. Cl.[4] H01R *11/00*

U.S. Cl. 339—60 M **5 Claims**



1. An electrical connector assembly comprising first and second matable rigid housings and sealing means, the first housing being moulded in one piece of plastics material and including inner and outer walls having surfaces extending in the mating direction and joined by a base wall defining between them an annular cavity, the sealing means comprising a resilient gasket received in the annular cavity, the second housing including a projecting shroud with a projecting wall of the shroud having a surface extending in the mating direction received in the cavity between the outer wall of the cavity and the gasket, so that the gasket is in sealing engagement with the surface of the inner wall of the cavity and the surface of the projecting wall of the shroud, a surface of the gasket facing the surface of the inner wall of the cavity being formed with a groove and being formed with a rib outstanding from the surface of the inner wall of the cavity which rib is received in the groove thereby to secure the gasket in the cavity, an aperture being formed in the base wall of the cavity in axial alignment with the rib.

4,621,884

ELECTRICAL SOCKET HAVING A HINGED COVER

Edward E. Berkebile, Jr., Harrisburg, and Edward J. Bright, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 683,526, Dec. 19, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 831,961

Int. Cl.[4] H01R *9/09*

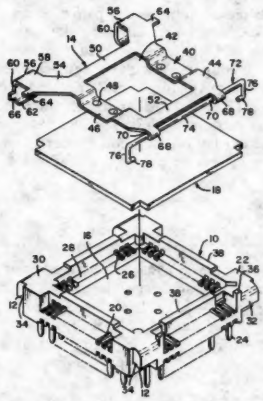
U.S. Cl. 339—75 MP **4 Claims**

1. An electrical socket for receiving an electronic package, comprising:

housing means having receiving means for removably receiving an electronic package and conductive means for electrically engaging an electronic package positioned in said receiving means;

downwardly facing shoulders at each end of two opposing side walls of said housing means; and

cover means for removably retaining an electronic package in said receiving means, said cover means comprising a front member having first latch means for being removably received in under said downwardly facing shoulders on one side wall of said housing means, a rear member having hook means and a hinge pin pivotally attached to said hook means and having second latch means for being received in under said downwardly facing shoulders on the opposing side wall of said housing means whereupon said cover means may be pivotally moved between an opened and a closed position on said socket.



4,621,885

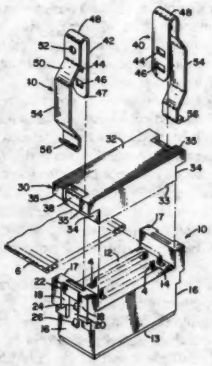
RIBBON CABLE CONNECTOR WITH IMPROVED COVER LATCH

David S. Szczesny, Harrisburg, and John A. Root, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 20, 1985, Ser. No. 778,095

Int. Cl.[4] H01R *13/62*

U.S. Cl. 339—91 R **6 Claims**



1. A ribbon cable connector of the type comprising an elongate housing with insulation displacing contacts projecting from the top surface thereof, an elongate cover having aper-

ture means therein for receiving said contacts, and latch means at opposite ends of the connector effective to fix said cover in first and second latched positions relative to said housing, said cover being spaced from said top surface in said first position to permit alignment of said cable for termination, said cover being movable from said first position toward said top surface to terminate said cable, said cover securing said cable in a terminated condition at said second position, characterized in that

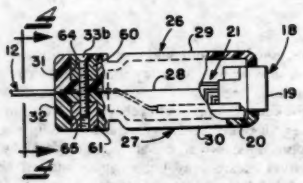
said latch means comprises a pair of stamped and formed metal latch members fixed to the cover at respective opposite ends thereof, each latch member having a first latch arm cooperable with the respective end of the housing to effect latching at said first and second positions, each latch member further comprising a second latch arm adjacent said first latch arm and spaced from said housing, said second latch arm being cooperable with a complementary connector to retain said ribbon cable connector thereto.

4,621,886

CONNECTOR WITH STRAIN RELIEF

Thomas E. Morgan, Concord, Ohio, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 19, 1984, Ser. No. 672,824
Int. Cl.[4] H01R *13/58*
U.S. Cl. 339—107 **7 Claims**



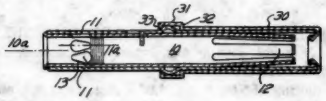
1. An electrical connector comprising a planar arrangement of multiple conductors; a pair of opposed, plastic strain relief bodies having housing end portions forming therebetween a housing for terminating means for said conductors and cable end portions forming therebetween a laterally elongate narrow slot of a width greater than that of said planar arrangement, said cable end portions having at said slot opposed inside surface means operative to engage and hold said planar arrangement of multiple conductors extending longitudinally through said slot from outside said bodies to the interior of said housing for connection to said terminating means; respective relatively rigid reinforcing means for stiffening each cable end portion against flexure along its width in the area of said surface means; and means at respective lateral ends of said reinforcing means for urging said reinforcing means towards one another and against said cable end portions to cause a clamping force to be applied by said cable end portions upon the cable at said surface means substantially across the full width of said planar arrangement of multiple conductors; said surface means including means for deforming said planar arrangement of multiple conductors; said planar arrangement of multiple conductors being a flat multi-conductor cable, said means for deforming including a plurality of protrusions operative to deform respective portions of said cable, said protrusions including laterally extending narrow beads arranged to deform the cable along plural laterally extending bends and along plural longitudinally extending bends to a limited extent short of damaging the cable, thereby securely to lock said planar arrangement of multiple conductors between said cable end portions to prevent forces applied to said planar arrangement from being transferred to said terminating means, said beads being arranged in plural rows in laterally staggered relationship, said beads on each of said strain relief bodies being staggered in relation to the relatively adjacent beads on the other, said reinforcing means including respective elongate metal bars which outwardly engage respective cable end portions of said strain relief bodies, and said means for urging including fastener means for holding said bars engaged against said cable end portions to clamp said cable end portions together.

4,621,887

ELECTRICAL CONTACT

R. Amelia Piscitelli, Sidney; David O. Gallusser, Oneonta; David L. Frear, Bainbridge; Valentine J. Hemmer, Sidney, and Charles P. Fischer, Bainbridge, all of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 9, 1981, Ser. No. 241,802
Int. Cl.[4] H01R *4/10*
U.S. Cl. 339—276 T **9 Claims**



1. A one piece unitary electrical contact stamped and formed from a single sheet of metal, said contact comprising:

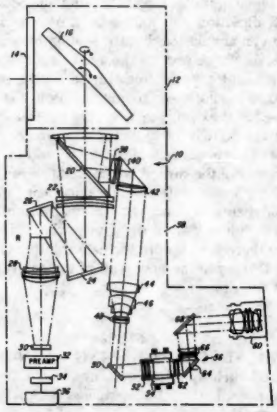
a sleeve having a central axis, a front mating portion and a rear wire receiving portion having at least four slots in the wall thereof, each slot having a generally triangular configuration including straight side portions that are at an acute angle with the central axis of said sleeve.

4,621,888

COAXIAL WIDEBAND REFRACTIVE OPTICAL SYSTEM

Robert E. Crossland, Plano, and Erwin E. Cooper, Carrollton, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 10, 1983, Ser. No. 473,891
Int. Cl.[4] G02B *13/14*
U.S. Cl. 350—1.2 **5 Claims**



1. A coaxial, wideband, refractive, optical system comprising: an optical path having a front, solid, wideband, objective lens for receiving incoming electromagnetic energy radiating at about 0.5 micron in the visible to about 12 microns wavelength in the infrared and for reducing the diameter of the energy beam; a beamsplitter positioned in the optical path after the front objective lens for dividing the incoming energy into

two paths; and color aberration correction lenses in said two optical paths for color aberration correction, said color aberration correction lenses comprising lens doublets; wherein the front, solid, wideband, objective lens is a positive lens and the doublet lenses include negative lenses and positive lenses, whereby the color dispersion of the front, solid, wideband, objective lens is corrected by the negative lenses of the doublets and the spherical aberrations are corrected by the positive lenses of the doublets acting in conjunction with the other lenses in the optical path.

4,621,889

CAMERA FILTER

Mitsuo Chikano, and Yuji Nakajima, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 532,129, Sep. 14, 1983, abandoned. This application Mar. 14, 1985, Ser. No. 711,552
Claims priority, application Japan, Sep. 14, 1982, 57-138443[U]
Int. Cl.[4] G02B *5/22, 5/28*
U.S. Cl. 350—1.6 7 Claims

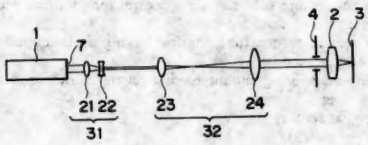
1. A camera filter, comprising; an ultraviolet ray absorbing member including a substrate, and an evaporated film which transmits blue light and green light but sharply attenuates a longer wavelength portion of red light, said evaporated film being formed on one surface of said substrate, and frame means for housing said substrate, said frame means being attachable to a camera.

4,621,890

OPTICAL APPARATUS INCLUDING TWO AFOCAL SYSTEMS

Akiyoshi Suzuki, Tokyo; Hideki Ina, Yokohama, and Kazuo Takahashi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1983, Ser. No. 555,526
Claims priority, application Japan, Dec. 1, 1982, 57-210912
Int. Cl.[4] G02B *26/08*
U.S. Cl. 350—6.1 8 Claims



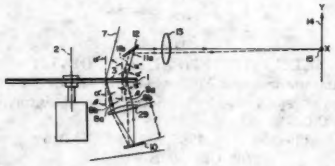
6. An optical apparatus, comprising:
means having an exit end, for emitting a laser beam from said exit end;
means for forming a pupil;
means for converging, into a spot, the laser beam emitted from said exit end of said emitting means and introduced through said pupil formed by said pupil forming means; and
means for forming an image of said exit end of said emitting means substantially on said pupil formed by said pupil forming means, said image forming means including a first afocal system, which is subjected to a vibration, the vibration being the same as a vibration of said emitting means and a second afocal system, which is subjected to a vibration, the vibration being the same as a vibration of said converging means, said first and second afocal systems being disposed in the order named from the exit end of said emitting means.

4,621,891

LIGHT BEAM SCANNING APPARATUS

Masaru Noguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 27, 1984, Ser. No. 584,263
Claims priority, application Japan, Feb. 28, 1983, 58-32554; Mar. 9, 1983, 58-38868
Int. Cl.[4] G02B *26/08*
U.S. Cl. 350—6.2 9 Claims



1. A light beam scanning apparatus comprising a rotatable plate provided with at least one plane diffraction grating, a light beam source for emitting a light beam incident on said plane diffraction grating so that the plane of incidence is a plane in which the rotation axis of said rotatable plate lies, a cylindrical lens positioned on the optical path of the light beam diffracted by said plane diffraction grating so that the axis of said cylindrical lens is normal to said plane of incidence, a plane reflection mirror for reflecting said light beam by a plane reflection surface thereof normal to said plane of incidence and for guiding said light beam again to said plane diffraction grating, said plane reflection mirror being spaced by a distance equal to the focal length of said cylindrical lens from said cylindrical lens, and a focusing lens for focusing the light beam diffracted again by said plane diffraction grating onto a scanning surface, whereby said scanning surface is scanned with a focused light spot as said rotatable plate is rotated.

4,621,892

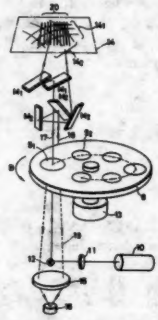
LIGHT SCANNING DEVICE USING LENSES

Keiji Katsoka, Kawagoe, Japan, assignor to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,584
Claims priority, application Japan, Nov. 10, 1982, 57-198272
Int. Cl.[4] G02B *3/02, 26/10*
U.S. Cl. 350—6.3 16 Claims

1. A light scanning device comprising means for irradiating a plane to be scanned with laser light along an optical path, moving means disposed for movement with respect to the optical path of the laser light, and means for providing a microlight spot of the laser light forming a light scanning line on the scanning plane, said microlight spot means including at least one lens having at least one aspheric surface disposed on the

moving means for continuous movement across the optical path of the laser light so as to provide the microlight spot of the



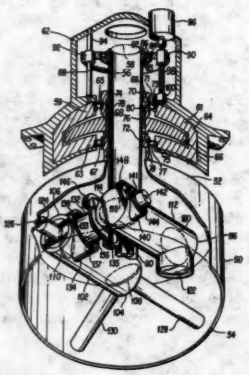
laser light forming the light scanning line on the scanning plane.

4,621,893

SATELLITE OPTICAL SCAN DEVICE

Gerd Lohmann, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 17, 1985, Ser. No. 735,015
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.5 **8 Claims**



4. An optical scan device for use in a satellite orbiting the earth comprising:

a first hollow cylinder having a first diameter, a first central longitudinal axis of first length, a first end, and a second end;

a second hollow cylinder having a second diameter smaller than said first diameter, a second central longitudinal axis of second length, a first end, and a second end;

an electric motor having a stator, and a rotor which revolves around an axis of rotation, said rotor having a hollow cylindrical shaft with a central longitudinal axis of third length smaller than said second length running through said rotor such that the axis of rotation of said rotor and the central longitudinal axis of said shaft are colinear, and said hollow cylindrical shaft having a diameter large enough for said second hollow cylinder to slidably fit in it, a first end, and a second end;

a first set of three axial track grooves spaced 120° apart and disposed in the outer wall of said second hollow cylinder;

a second set of three axial track grooves spaced 120° apart and disposed in the inner wall of said hollow cylindrical shaft such that they match said first set of three axial track grooves;

a first set of ball bearings disposed in a first matched pair of axial track grooves such that a first linear ball bearing is formed;

a second set of ball bearings disposed in a second matched pair of axial track grooves such that a second linear ball bearing is formed;

a third set of ball bearings disposed in a third matched pair of axial track grooves such that a third linear ball bearing is formed;

a first torque tube ball bearing having an inner race and an outer race;

said inner race of said first torque tube ball bearing being concentrically attached to the first end of said second hollow cylinder;

a carrier ring;

a ball nut;

a ball slide;

a stabilizer rod;

said carrier ring is concentrically attached to said outer race of said first torque tube ball bearing, to said ball nut, and to said ball slide such that said ball nut and said ball slide are 180° apart;

a step motor;

a lead screw attached to said step motor and threaded through said ball nut such that the rotation of said lead screw causes said ball nut to travel along said lead screw imparting linear motion to said second hollow cylinder so that said second hollow cylinder travels linearly through the hollow cylindrical shaft of said rotor;

said ball slide is slidably attached to said stabilizer rod;

means for attaching said first hollow cylinder to said rotor such that said first central longitudinal axis and said second central longitudinal axis are colinear and such that the second end of said second hollow cylinder extends into said first hollow cylinder;

a first periscope having a first periscope tube with a first end, a second end, and a longitudinal axis, and with a first mirror disposed in its first end and a second mirror disposed in its second end;

a second periscope having a second periscope tube with a first end, a second end, and a longitudinal axis, and with a third mirror disposed in its first end and a fourth mirror disposed in its second end;

said first periscope being attached inside and to said first hollow cylinder such that said first mirror is positioned with its optical axis coincident with the axis of rotation of said rotor;

a connecting tube having a central longitudinal axis, a first end, and a second end;

a second torque tube bearing having an inner race and an outer race;

an end bearing mount having an outer race and an inner race;

a gear sector;

a gear rack;

said inner race of said second torque tube bearing being concentrically connected to the first end of said connecting tube;

said outer race of said second torque tube bearing being attached to the second end of said first periscope tube such that the central longitudinal axis of said connecting tube is colinear with the optical axis of said second mirror;

said second end of said connecting tube being attached to the first end of said second periscope tube such that the central longitudinal axis of the connecting tube is colinear with the optical axis of said third mirror;

said inner race of said end bearing mount being attached to the inside of said first hollow cylinder and said outer race

of said end bearing mount being attached to the first end of said second periscope tube such that the second end of said second periscope tube can tilt when said connecting tube is rotated;

said gear sector being attached to said connecting tube; and

said gear rack being mounted on the outside and at the second end of said second hollow cylinder such that its teeth mesh with the teeth of said gear sector.

4,621,894

A DEVICE FOR DISTRIBUTING LIGHT ENERGY INCLUDING AT LEAST ONE INLET FIBER WITH A CHAMFERED OUTLET END AND A DIFFRACTION GRATING, AND APPLICATION THEREOF TO OPTICAL SWITCHING

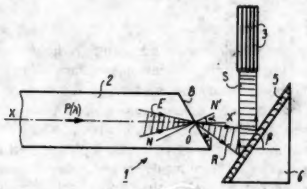
Mohamed Gouali, Paris, France, assignor to Lignes Telegraphiques et Telephoniques L.T.T., France

Filed Jun. 13, 1985, Ser. No. 744,366

Claims priority, application France, Jun. 13, 1984, 84 09199

Int. Cl.[4] G02B 6/34

U.S. Cl. 350—96.19 **6 Claims**



1. In a light energy distributing device comprising at least one optical inlet fiber for receiving light energy, and a plurality of outlet optical fibers over which said light energy is distributed, the improvement wherein the outlet end of said at least one inlet fiber is chamfered at a given angle α to refract the light beam emerging therefrom, and said device further including a diffraction grating positioned to receive the light beam emerging from said at least one inlet fiber and inclined relative to the axis of said at least one inlet fiber at an angle β such that the diffracted outlet light beam becomes a substantially parallel beam, and said plurality of outlet fibers being disposed on the path of said parallel beam to receive light energy therefrom.

4,621,895

REFLECTIVE/REFRACTIVE/REFLECTIVE PRECISION CONNECTOR, (MR3PC)

Gerard J. Motsko, 14898 Easingwold Dr., Houston, Tex. 77015

Filed Jun. 4, 1984, Ser. No. 617,227

Int. Cl.[4] G02B 6/38

U.S. Cl. 350—96.21 **3 Claims**

1. An optical fiber connector used to join like optical fiber waveguides and comprising:

an assembly containing optical fiber input and output ports where, for the purpose of defining orientation for all further discussion, all input optical fibers enter on the left side of said connector while all output optical fibers leave on the right side of said connector;

three sections designated as top, mid and bottom with each section having the same length and width, the height and size of each section determined by design application, the three sections joined in a manner to permit disassembly and reassembly to the original manufactured configuration;

input and output fiber ports formed along the entire length at the parting lines of said sections to accept one or more input optical fibers between the top and mid sections and a corresponding number of output optical fibers between the bottom and mid sections;

input and output fiber ports parallel to each other and in precise vertical alignment with each other;

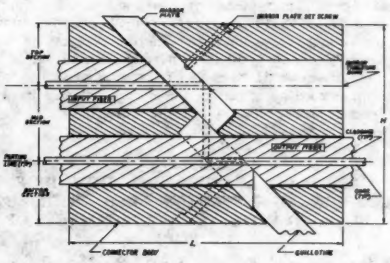
input and output mirror plate slots oriented across the connector width along a line that is perpendicular to the optical fiber longitudinal axis and formed to pass through the respective input and output fiber ports at a preferred design angle of 45 degrees to the respective input and output optical fiber longitudinal axis and to a depth sufficient to cause parallel overlap between said slots in the connector mid section;

input fiber port(s) sized to firmly clamp the input optical fiber(s) to the left of the input mirror plate slot while permitting the input fiber cutoff section(s) to the right of the input mirror plate slot to slide freely within said fiber port(s);

output fiber port(s) sized to firmly clamp the output optical fiber(s) to the right of the output mirror plate slot while permitting the output fiber cutoff section(s) to the left of the output mirror plate slot to slide freely within said fiber slot(s);

input and output mirror plates marked and indexed to prevent interchange and sized to fit snugly in the respective mirror plate slots, said mirror plates parallel and overlapping in the connector mid section in such a manner as to provide a continuous refractive path for the reflected optical light signal(s) through both mirror plates;

mirror plates fabricated such that as a minimum, those portions which transmit the optical light signal consist of the same type of transparent material with the same index of refraction as that of the optical fiber core material and where light scattering is a problem, the remaining portions of the mirror plates consist of transparent material having the same index of refraction as that of the optical fiber cladding material;



mirror plates that provide highly reflective surfaces to the optical light signal when in contact with the transparent substance air which has a lower index of refraction than that of the mirror plate material which transmits the optical light signal;

mirror plates having slightly concave reflective surfaces formed at desired locations as determined by targeting the centerline of the respective optical fiber ports, the reflective surfaces sizes slightly larger than the surface imposed by the maximum calculated optical fiber core endface in contact with the mirror plate;

guillotines sized to fit snugly in the mirror plate slots and designed to achieve a clean smooth cut to the end surface of input and output optical fibers at the precise design angle;

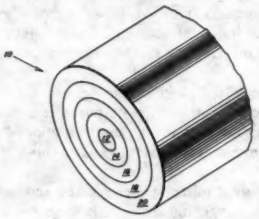
setscrews to lock the mirror plates in place and to position said mirror plates in the same precise alignment to each other and to the respective input and output optical fibers at all times while also providing a tight flush fit of the mirror plates with said optical fiber end surfaces and with respect to each other.

4,621,896

OPTICAL FIBERS WITH REDUCED PRESSURE SENSITIVITY TO HIGH FREQUENCY ACOUSTIC FIELD

Nicholas Lagakos, Silver Spring, Md.; James H. Cole, Great Falls, and Joseph A. Bucaro, Herndon, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 30, 1984, Ser. No. 635,693
Int. Cl.[4] G02B *6/20*
U.S. Cl. 350—96.29 **15 Claims**



1. An optical fiber waveguide that has reduced pressure sensitivity to high frequency acoustic fields in a fluid comprising:

an optical fiber including an optical core and concentric cladding;

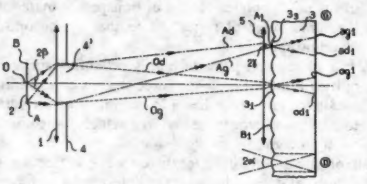
and a fiber jacket disposed over said concentric cladding and including at least two coatings concentrically surrounding the optical fiber wherein the innermost coating has a low young's modulus and the outermost coating has a high enough young's modulus to reduce radial strains in the optical core by impeding the energy transfer from the acoustic fields in the fluid to the core.

4,621,897

OPTICAL APPARATUS AND A METHOD OF RECORDING OR INSTANTANEOUSLY VISULIZING ENLARGED AND STEREOSCOPIC IMAGES OF OBJECTS

Maurice Bonnet, Puteaux, France, assignor to Centre National de la Recherche Scientifique (CNRA), France

Filed Jan. 18, 1983, Ser. No. 458,878
Claims priority, application France, Jan. 22, 1982, 82 00965
Int. Cl.[4] G02B *27/22*; G03B *35/00*; G03C *9/08*
U.S. Cl. 350—130 **26 Claims**



1. A method allowing the instantaneous production of enlarged and steroscropic images of objects, which method comprises:

(a) forming by means of a stationary stopped down lens (1,4) an enlarged image of an object (2) in the vicinity of elementary lenses of a first lenticular grating (3) having an angle of field (2α) substantially equal to the angle (2γ) of aperture of the exit pupil of the lens viewed from said first lenticular grating (3), in order to produce an instantaneous, composite, sampled image at the level of the focal plane of the first lenticular graitng,

(b) forming an orthosteroscopic image by means of a second lenticular grating (9, 10') which differs from the first,

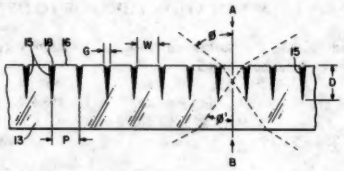
(c) observing the orthostereoscopic composite image thus formed by means of a lenticular observation grating (10, 10') which has an angle of field substantially equal to the angle of aperture (2β) of the entrance pupil of the lens (1) viewed from the object (2).

4,621,898

DIRECTIONAL OPTICAL FILTER

Richard L. Cohen, Matawan, N.J., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 17, 1983, Ser. No. 476,297
Int. Cl.[4] G02B *5/20*
U.S. Cl. 350—276 R **17 Claims**



1. Filter for selectively admitting radiant energy to pass therethrough including at least one radiant energy transmitting media having first and second sides, and a surface of the media on the first side, wherein an image on one side of the media can be viewed from the other side, characterized by:

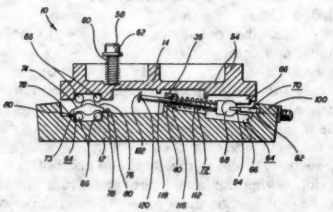
said surface being interrupted by a plurality of light-absorbing grooves, the plurality of grooves extending from said surface, extending less than completely through the media and arranged in a pattern, the grooves having a characteristic of absorbing said radiant energy impinging thereon from within the media, such that radiant energy passing said surface from a pre-determined angle from normal to said surface is substantially absorbed and radiant energy passing said surface from less than said pre-determined angle and not impinging upon the grooves is transmitted in accordance with radiant energy transmitting characteristics of said media for that energy.

4,621,899

ASSEMBLY FOR POSITIONING AN OPTICAL ELEMENT

Robert A. Hoult, Bethel, and Charles F. deMey, West Redding, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 9, 1984, Ser. No. 598,768
Int. Cl.[4] G02B *00/00*
U.S. Cl. 350—321 **8 Claims**



2. Assembly for positioning an optical element, comprising:

a frame member;

a base member, said base member being affixed to and spaced apart from one wall of said frame member, said base member having means for rigidly affixing said optical element thereto;

means for tilting said base member with respect to said wall of said frame member, said tilting means having a coarse and fine tilt adjustment means assocated therewith;

said tilting means including:

a pair of tracks, said tracks being defined by two pairs of track forming elements;

means, associated with each said track, for varying the distance between said pairs of track forming elements;

said distance varying means including:

a track translation member; and

means for urging said track translation member along said track;

each said track including two pairs of rods, one pair being associated with said frame member and the other pair being associated with said base member, said pairs being oblique thereby defining an inclined track; and

said track translation member being a sphere.

4,621,900
LIQUID CRYSTAL COMPOSITIONS

Bunzo Kiyonaga, Shiojiri, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

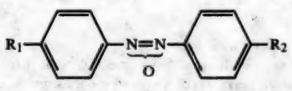
Filed Sep. 25, 1984, Ser. No. 654,067

Claims priority, application Japan, Sep. 27, 1983, 58-178436

Int. Cl.[4] G02F *1/13*; C09K *3/34*

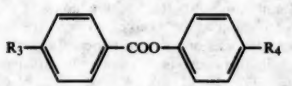
U.S. Cl. 350—350 R **14 Claims**

1. A liquid crystal composition comprising at least one P,P'-dialkylazoxybenzene component having the general formula (1) as follows:

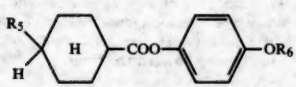


(1)

wherein R_1 represents a straight-chain alkyl group of 1–10 carbon atoms, and R_2 represents a straight-chain alkyl group of 1–10 carbon atoms and at least one component selected from the group of Compounds (2), Compounds (3) and Compounds (4) of the general formulae, respectively:



(2)



(3)

(4)

wherein R_3 represents a straight-chain alkyl or straight-chain alkoxy group of 1–10 carbon atoms, R_4 represents a straight-chain alkyl or straight-chain alkoxy group of 1–10 carbon atoms, R_5 represents a straight-chain alkyl group of 1–8 carbon atoms, R_6 represents a straight-chain alkyl group of 1–8 carbon atoms, R_7 represents a straight-chain alkyl group of 1–10 carbon atoms, and R_8 represents a straight-chain alkyl group of 1–10 atoms, and including about 30–80 weight percent of compounds of formula (1), when present about 5–20 weight percent of compounds of formula (2), when present about 5–50 weight percent of compounds of formula (3), when present about 5–20 weight percent of compounds of formula (4) and an effective amount of a compound exhibiting a positive dielectric anistropy to yield a composition having a net positive dielectric anistropy.

4,621,901
NOVEL LIQUID CRYSTAL MIXTURES

Martin Petrzilka, Kaiseraugst, and Martin Schadt, Seltisberg, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 26, 1985, Ser. No. 749,163

Claims priority, application Switzerland, Jul. 12, 1984, 3385/84; May 6, 1985, 1899/85

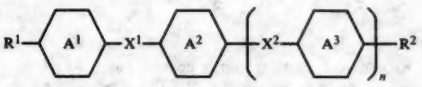
Int. Cl.[4] G02F *1/13*; C09K *3/34*

U.S. Cl. 350—350 R **10 Claims**

1. A liquid crystalline mixture containing

(a) a liquid crystalline carrier material; and

(b) a compound of the formula:



I

wherein n is the integer 0 or 1; X^1 and X^2 are single covalent bonds or one of X^1 and X^2 also is —COO—, —OOC— or $-CH_2CH_2-$; the rings A^1, A^2 and A^3 independently are 1,4-phenylene, 2-fluoro-1,4-phenylene or trans-1,4-cyclohexylene or one of these rings also is 2,5-disubstituted pyrimidine or trans-2,5-disubstituted m-dioxane; R^1 is 4-alkenyl or when positioned on a cyclohexyl ring R^1 also can be 2Z-alkenyl; and R^2 is alkyl, alkoxy, —CN or —NCS.

4,621,902
DEVICE FOR PROJECTING THE IMAGE OF A RETICLE IN AN OPTICAL SYSTEM

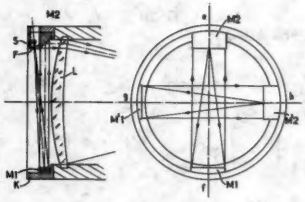
Fernand R. Loy, Sceaux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 28, 1984, Ser. No. 675,493

Claims priority, application France, Dec. 23, 1983, 8320692

Int. Cl.[4] G02B *21/36*

U.S. Cl. 350—576 **4 Claims**



1. A reticle projection system comprising:

an objective lens having an optical axis and a pupil;

a first collimator arranged at a first position at an outer edge of the pupil, the first collimator collimating light from a first slit and projecting the collimated image through the objective; and

a second collimator arranged at a second position at the outer edge of the pupil, the second collimator collimating light from a second slit and projecting the collimated image through the objective;

characterized in that:

the objective forms images of the slits, the images of the slits intersecting on the optical axis;

the image of the first slit extends radially with respect to the optical axis in the direction of the first collimator; and

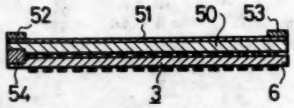
the image of the second slit extends radially with respect to the optical axis in the direction of the second collimator.

4,621,903

ELECTRO-OPTIC LIGHT SHUTTER

Kanji Murano, Nishiminemachi; Susumu Nishigaki, Yokohama; Masami Himuro, Tokyo, and Yoshihisa Watanabe, Kawasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 4, 1984, Ser. No. 568,040
Claims priority, application Japan, Jan. 14, 1983, 58-4513
Int. Cl.[4] G02F *1/03*
U.S. Cl. 350—390 **8 Claims**



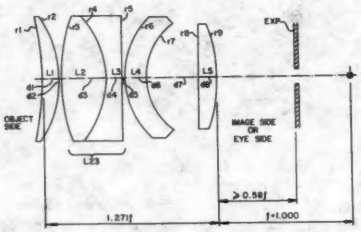
1. An electro-optic light shutter comprising:
a ceramic body composed of a PLZT ceramic whose composition is such that it has a memory effect at room temperature and loses the memory effect and exhibits a quadratic electro-optic effect at an elevated temperature above room temperature,
means for applying a linear polarized light to said ceramic body,
means to detect light passed through said ceramic body,
means for applying an operational voltage to said ceramic body,
means for applying an AC voltage to heat said ceramic body at least to said elevated temperature,
said composition, operational voltage, and AC voltage being selected such that the operational power utilized by said body is substantially minimized.

4,621,904

MAGNIFIER LENS SYSTEM

Ludvik Canzek, Quellmattstrasse 3, 5035 Unterentfelden, Switzerland

Filed Sep. 7, 1984, Ser. No. 648,294
Claims priority, application Switzerland, Sep. 19, 1983, 5062/83
Int. Cl.[4] G02B *25/00, 9/34*
U.S. Cl. 350—410 **4 Claims**



1. A magnifier lens system having a focal length f and an exit pupil with a distance from a last lens vertex of at least 0.58f, comprising:
a positive object-side lens;
a central lens group;
a lens group on the eye-side;
said central lens group being positive and including a cemented positive lens and a negative lens;
said lens group on the eye-side including a meniscus lens having a concave side and a positive lens separated by an air space;
said meniscus lens facing the eye with said concave side thereof; and
a thickness of said object side lens being in accord with the relation:

$$d_1 \leqq 0.45f,$$

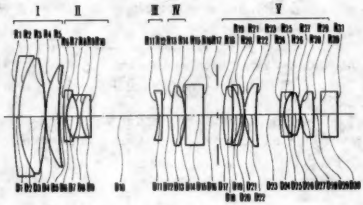
wherein d_1 is said thickness and f is said focal length.

4,621,905

FAST COMPACT ZOOM LENS

Masatake Kato, and Muneharu Sugiura, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,535
Claims priority, application Japan, Aug. 31, 1983, 58-159653
Int. Cl.[4] G02B *15/14*
U.S. Cl. 350—427 **2 Claims**



1. A zoom lens comprising:
a varifocal section including, from front to rear, a first lens unit of positive refractive power for focusing, a second lens unit of negative refractive power movable for variation, a third lens unit for compensation which is movable simultaneously with said second lens unit and a fourth lens unit of positive refractive power; and
an image forming section arranged on the image side of said varifocal section and including a front lens unit and a rear lens units with an air space therebetween,
said front lens unit consisting of a positive lens with its front surface of strong curvature convex toward the front, a negative meniscus lens of forward concavity, and a positive lens with its front surface of strong curvature convex toward the front, and
said rear lens unit consisting of a negative meniscus lens of forward convexity, a positive meniscus lens of forward concavity, and a positive lens with its front surface of strong curvature convex toward the front.

4,621,906

AUTO-FOCUS ZOOM LENS ASSEMBLY

Akihiko Hashimoto, Tokyo; Hitoshi Shirai, Sagamihara, and Kazutoshi Shiratori, Tokyo, all of Japan, assignors to Olympus Optical, Tokyo, Japan

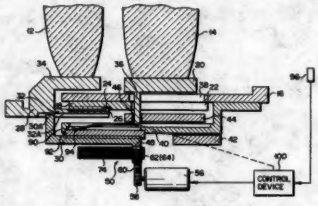
Continuation of Ser. No. 372,698, Apr. 28, 1982, abandoned. This application Mar. 27, 1985, Ser. No. 716,527
Claims priority, application Japan, May 14, 1981, 56-72740
Int. Cl.[4] G02B *7/11*
U.S. Cl. 350—429 **12 Claims**

1. A zoom lens assembly with an auto-focus function, comprising:
a stationary hollow cylinder arranged to be fixed to a camera body, said cylinder having an optical axis;
a distance-presetting ring which is fitted for rotation around the circumference of said cylinder and provided with a first group of lenses to adjust a focus condition of the image of a foreground object at a film surface in the camera body by being rotated;

a zoom ring which is fitted for rotation around the circumference of said cylinder and set next to the distance-presetting ring in the axis direction and in concentric relationship, said zoom ring being provided with a second group of lenses to control a focal length by being rotated;

drive means arranged at the outer periphery of the distance-presetting ring for rotating said distance-presetting ring about said optical axis;

detection means arranged in the vicinity of the film surface for indicating the focused state of the image of the foreground object at the film surface, said detection means being supplied with a beam of light reflected from the foreground object through said first and second groups of lenses and including a light-receiving element arranged to detect a direction and amount of displacement between a position of an image forming plane for the foreground



object and the film surface, said light-receiving element being operative to supply a detection signal representing said direction and said amount of displacement;

control means coupled to the detection means for causing the drive means to rotate the distance-presetting ring to adjust the focus condition at the film surface in accordance with the detection signal supplied from the detection means; and

instruction means associated with said distance-presetting ring and said zoom ring for detecting a change in the focal length caused by the rotation of the zoom ring and for supplying to said control means information relating to that extent to which said distance-presetting ring is to be rotated to maintain the focus condition of the image of the foreground object at the film surface notwithstanding the changed focal length.

4,621,907

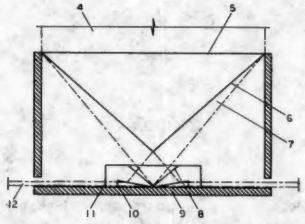
CONICAL BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Oct. 5, 1984, Ser. No. 657,928

Int. Cl.[4] G02B *13/18*

U.S. Cl. 350—432 **1 Claim**



1. A conical beam concentrator TTRT-RT:C comprising an upper component lens RT (1) having a planar section (5) which receives and transmits a circular whole incipient beam (4), and having a convex conical section (6) which refracts incipient beam (4), forming convergent conical beam (7); and comprising a lower component lens TTRT (2) mounted below upper component lens RT (1) and having a concave conical section (8) which transmits convergent conical beam (7), having a convex conical section (9) which refracts convergent conical beam (7), forming concentrated divergent lateral beam (12), and having two cylindrical sections (10,11) which emit the concentrated divergent lateral beam (12) in the horizontal plane.

4,621,908

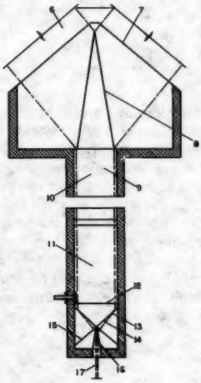
MONOCHROMATIC BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Oct. 9, 1984, Ser. No. 658,936

Int. Cl.[4] G02B *13/18, 1/06;* F24J *2/04, 2/08*

U.S. Cl. 350—432 **1 Claim**



1. A monochromatic beam concentrator comprising in general an upper stage lens which receives a convergent conical incipient beam of diffused sunlight, a colored-water fluid chamber mounted below the upper stage lens so as to transmit the beam emitted by the upper stage lens, and a lower stage lens mounted below the fluid chamber so as to concentrate the beam emitted by the fluid chamber, and comprising in particular;

an upper stage lens RT (1) having a convex conical section (7) which receives and transmits a convergent conical incipient beam (6) of diffused sunlight, and having a concave conical section (8) which refracts and emits said convergent conical incipient beam (6), forming a concentrated whole beam (9),

a tubular light conduit (10) mounted vertically below said upper stage lens RT (1) so as to transmit and emit said concentrated whole beam (9),

a fluid chamber (11) mounted below said tubular light conduit (10) and vertically aligned therewith so as to transmit and emit said concentrated whole beam (9), and

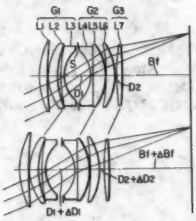
a lower stage lens 2RT (2) mounted below said fluid chamber (11) and comprising an upper component lens RT (4) having a planar section (12) which receives and transmits said concentrated whole beam (9) and having a convex conical section (13) which refracts and emits said concentrated whole beam (9), forming a convergent conical beam (14), and comprising a lower component lens RT (5) having a convex conical section (15) which transmits said convergent conical beam (14) and having a concave conical section (16) which refracts and emits said convergent conical beam (14), forming a concentrated whole beam (17) which is emitted parallel to the vertical optic axis of the beam concentrator.

4,621,909

PHOTOGRAPHIC LENS OF A GREAT APERTURE RATIO

Yoshinari Hamanishi, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 15, 1983, Ser. No. 485,481
Claims priority, application Japan, Apr. 26, 1982, 57-70124
Int. Cl.[4] G02B 9/62, 9/64
U.S. Cl. 350—464 10 Claims



1. A photographic lens of a great aperture ratio in which the performance of short distance photography is maintained well, said photographic lens comprising, in succession from the object side, a first unit having a positive refractive power, a second unit having a positive refractive power, a third unit having a positive refractive power, and a stop member disposed between said first unit and said second unit, said first, second and third units being movable at different speeds toward the object side relative to the image plane during the shift from the infinity photography condition to the short distance photography condition, said photographic lens satisfying the following conditions:

$$1.5<\alpha<9.0 \quad (1)$$

$$0.2<\beta<3.0 \quad (2)$$

wherr when the amount of variation in the spacing between said first unit and said second unit resulting from the movement of each unit for the focusing to the infinity object to the closest distance object is ΔD_1 and the amount of variation in the spacing between said second unit and said third unit is ΔD_2 and the amount of variation in the spacing between said third unit and the image plane is ΔB_f, α and β are defined as follows:

$$\alpha=\Delta B_f/\Delta D_1,$$

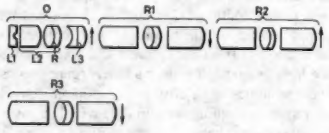
$$\beta=\Delta D_2/\Delta D_1.$$

4,621,910

OBJECTIVE FOR AN ENDOSCOPE

Susumu Takahashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1984, Ser. No. 617,735
Claims priority, application Japan, Jun. 8, 1983, 58-100856
Int. Cl.[4] G02B 9/34, 9/60
U.S. Cl. 350—469 24 Claims



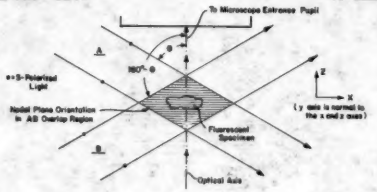
1. An objective for an endoscope to be used in an endoscope employing relay lenses, said objective for an endoscope comprising, in the order from the object side, a negative lens unit, a positive lens unit, and a lens unit comprising a cemented meniscus lens arranged to be concave toward the object side.

4,621,911

STANDING WAVE LUMINESCENCE MICROSCOPY

Frederick Lanni; D. Lansing Taylor, and Alan S. Waggoner, all of Pittsburgh, Pa., assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Mar. 12, 1985, Ser. No. 711,065
Int. Cl.[4] G02B 21/06
U.S. Cl. 350—524 47 Claims



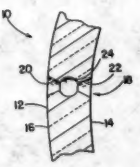
1. An optical apparatus for observing a luminescent specimen comprising a luminescence optical microscope, standing wave field producing means for producing on the optical axis of said microscope a standing wave field of coherent light including nodes and antinodes at said specimen, said standing wave field producing means including at least one source of coherent light to form said standing wave field and to excite fluorescence or phosphorescence in said specimen at said antinodes, filter means in said microscope for absorbing scattered light at the excitation wavelength and for passing the wavelengths that correspond to the luminescence of the specimen, and supporting means for supporting said specimen in said standing wave field.

4,621,912

FORAMINATED OPTICAL CONTACT LENS

Donald R. Meyer, 17 Wilcox Ave., Meriden, Conn. 06450

Filed Feb. 14, 1985, Ser. No. 701,407
Int. Cl.[4] G02C 7/04; B23K 9/16
U.S. Cl. 351—160 R 10 Claims



1. A contact lens comprising a transparent lense body having a contact surface and a frontal surface and defining at least one axially elongated micro passageway extending though said lense body and having opposite end portions, one of said end portions opening through said contact surface, the other of said end portions opening through said frontal surface, said micro passageway having a radially enlarged portion intermediate said end portions and communicating with said end portions.

4,621,913
MICROSCOPE WITH PROJECTOR

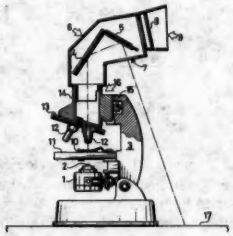
Masaharu Yamada, and Iseo Konno, both of Tokyo, Japan, assignors to Kabushiki Kaisha Yamada Kohgaku Seisakusho and Shin Nihon Tsusho Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,208

Claims priority, application Japan, Sep. 10, 1984, 59-136856[U]

Int. Cl.[4] G02B *21/18, 21/36*

U.S. Cl. 353—39 **3 Claims**



1. In combination, a microscope having a light source, at least one objective lens and means for receiving an eyepiece and a projector having a body tube with a fixed reflector and a rotatable mirror mounted therein, a projecting window in the body tube disposed below the rotatable mirror, a screen located at the top of the body tube and a fitting which is adapted to mate with the eyepiece receiving means of the microscope, the fixed reflector reflecting light conveyed by said at least one objective lens, said rotatable mirror being movable between a position in which the light reflected from the fixed reflector is directed to said screen and a position in which the light reflected from said fixed reflector is directed through said projecting window.

4,621,914
CAMERA SYSTEM

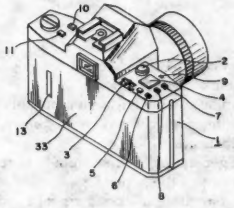
Nobuyuki Taniguchi, Tondabayashi; Masatake Niwa, Sakai; Akira Fujii, Sennan; Takeo Hoda, Sakai; Masaaki Nakai, Nara; Minoru Sekida, Sakai, and Masayoshi Sahara, Sennan, all of Japan, assignors to Minolta Camera KK, Japan

Filed Jul. 25, 1984, Ser. No. 634,474

Claims priority, application Japan, Jul. 27, 1983, 58-138129; Jul. 29, 1983, 58-139600; Aug. 8, 1983, 58-144547; Aug. 8, 1983, 58-144549; Aug. 17, 1983, 58-150572; Jun. 22, 1984, 59-129572; Jun. 25, 1984, 59-131452; Jun. 25, 1984, 59-131453

Int. Cl.[4] G03B *7/24, 7/26, 17/18, 17/36*

U.S. Cl. 354—21 **37 Claims**



1. A camera functioning with stored data, comprising:

means for sensing film speed data on the surface of a film cartridge adapted to be loaded in the camera;

means for producing a data reading signal prior to an exposure to the first effective frame of the film;

means for reading the sensed film speed data in response to the data reading signal;

means for disabling said reading means from further reading the sensed film speed data when the data reading, in response to the data reading signal, is once completed;

means for storing the read film speed data;

means for indicating at least the stored film speed data;

means for measuring light to generate a light measuring signal;

means for calculating exposure data in accordance with the stored film speed data and the light measuring signal;

a back lid for enclosing the film cartridge when it is loaded in the camera, wherein said producing means includes means for originating the data reading signal in response to the closure of said back lid;

means for determining whether or not the film is advanced to the first effective frame; and

means, responsive to said determining means, for controlling said indicating means to continue the indication of the stored film speed data until the film is advanced to the first effective frame, and switching said indicating means to indicate the calculated exposure data when the film is advanced to the first effective frame.

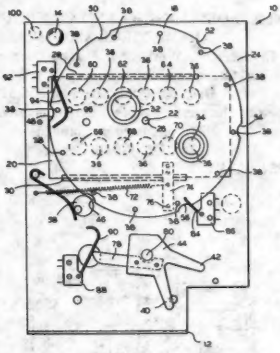
4,621,915
MULTI-IMAGE CAMERA

Michael Klainos, Libertyville, Ill., assignor to Identification Products Mfg. Co., Libertyville, Ill.

Filed Dec. 10, 1984, Ser. No. 680,627

Int. Cl.[4] G03B *1/00*

U.S. Cl. 354—121 **5 Claims**



1. A photographic automatic camera for sequentially exposing a plurality of areas on a single sheet of photo-sensitive film;

said camera comprising a movable lens turret and a movable shutter plate mounted on one side of a mounting plate;

said movable lens turret rotatably mounted to said mounting plate about a pivot pin extending through said lens turret and said mounting plate;

said mounting plate having a plurality of apertures extending therethrough;

said camera including means for holding said photo-sensitive film on the opposite side of said mounting plate;

said lens turret having two lens apertures therein, each said lens aperture being located on said lens turret at a different radial distance from said pivot pin relative to one another, whereby said lens turret is movable to sequentially position only one of said two lens apertures adjacent one of said mounting plate apertures at a time;

said shutter plate including a plurality of apertures extending therethrough, whereby said shutter plate is movable from a first position whereby said mounting plate apertures are closed by said shutter plate, to a second position whereby

said shutter plate apertures are in alignment with said mounting plate apertures;

said two lens apertures in said lens turret being located in said lens turret relative to each other whereby sequential rotational movement of said lens turret locates only one of said two lens apertures adjacent an aperture in said mounting plate while the remaining lens turret aperture is disposed adjacent the mounting plate, thereby preventing light from passing through the mounting plate apertures except the mounting plate aperture adjacent said one lens aperture when said shutter plate is in said second position;

first actuating means adapted to move said lens turret into and out of said position including first engagement means operatively connected to said lens turret;

second actuating means adapted to move said shutter plate from said first position to said second position;

power means for operating both said first and second actuating means, said power means comprising a single power source drivingly connected to a lever arm assembly to sequentially operate said first and second actuating means;

said lever arm assembly including lens operating cam means adapted to be operated by said power source to move said lens turret into and out of position to align said lens apertures with said mounting plate apertures;

whereby said power means is adapted to move said shutter plate to said second position when one of said lens turret apertures is in alignment with one of said mounting plate apertures to expose said photo-sensitive film.

4,621,916

MAGNETIC POSITIONING AND CONTOURING OF A BLADE MECHANISM

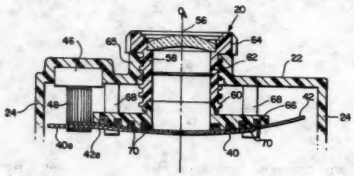
Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1983, Ser. No. 566,310

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.[4] G03B *9/42*

U.S. Cl. 354—234.1 **12 Claims**



1. A blade mechanism for use in controlling scene radiation along a given optical axis, said mechanism comprising:

means for unblocking and blocking the optical axis for controlling scene radiation therealong, said unblocking means includes at least a thin, flexible blade member which is generally translatable along a path intersecting the optical axis; means for driving said blade member, said driving means including a driving surface which cooperates with said blade member so as to allow translation of the latter along the intersecting path and along said optical axis, supporting means including a blade supporting surface for supporting said blade member during translation along said path; and

means for magnetically coupling said blade member to said supporting means so as to retain said blade member in intimate supporting engagement with said supporting surface when said blade translates relative to said supporting means along said path.

4,621,917

AUTOMATIC FOCUSING ADJUSTMENT DEVICE

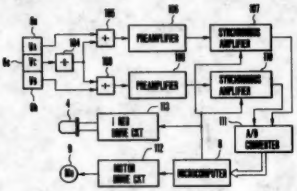
Naoya Kaneda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Sep. 5, 1985, Ser. No. 772,768

Claims priority, application Japan, Sep. 7, 1984, 59-187316

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—403 **2 Claims**



1. An automatic focusing adjustment device comprising:

(a) means for projecting a distance measuring light beam onto an object to be photographed;

(b) photosensitive means having three domains in a light receiving surface thereof, a central domain and two flanked domains;

(c) means for dividing a signal from said central one of the three divided domains of said photosensitive means;

(d) first and second adding means for adding an output signal from said dividing means to signals of said flanked domains of said photosensitive means; and

(e) means for detecting a focusing control signal based on an output signal of said first and second adding means.

4,621,918

COMPENSATION FOR DIAPHRAGM CONTROL IN SLR CAMERA

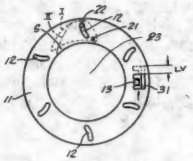
Masahiro Kawasaki, Tokyo; Zenichi Okura, Ichikawa, and Fumio Urano, Omiya, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 229,879, Jan. 30, 1981. This application Feb. 19, 1981, Ser. No. 235,839

Claims priority, application Japan, Feb. 19, 1980, 55/19965

Int. Cl.[4] G03B *7/085*

U.S. Cl. 354—448 **11 Claims**



1. A camera comprising:

a displaceable actuator;

a diaphragm adjustable between a maximum aperture value and a minimum aperture value responsive to displacement of the actuator;

means for generating a first signal representative of the displacement of the actuator;

means for generating a second signal representative of the desired aperture value of the diaphragm for correct exposure;

means for comparing the first and second signals;

means for displacing the actuator upon shutter release;

means for maintaining the diaphragm at the maximum aperture value during an initial portion of the displacement of the actuator after which the diaphragm stops down from

the maximum aperture value toward the minimum aperture value as the actuator is displaced; and

means responsive to the comparing means for arresting the displacement of the actuator when the first and second signals assume a predetermined relationship.

4,621,919

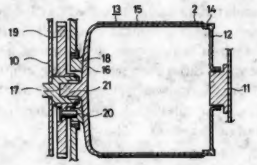
METAL DRUM AND IMAGE HOLDING MEMBER USING THE SAME

Hiroshi Nitanda, Tokyo; Morikazu Mizutani; Taketoshi Yokoyama, both of Kawasaki; Jun Tamai, and Toru Okumura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1983, Ser. No. 513,351

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 DR **27 Claims**



1. An image holding member for electrophotography having a metal drum, wherein said drum has first and second side faces, said first side face being formed integrally with the peripheral surface of the drum, characterized in that the image holding member has a rotatory shaft formed integrally at the center of said first side face, and has at least one formation on said first side face for receiving an external rotational driving force to rotate the metal drum, wherein the integrally formed rotary shaft and the formation are spaced from said second side face.

4,621,920

PRECONDITIONING A PHOTOSENSITIVE DRUM PRIOR TO ACTUAL PHOTOCOPYING

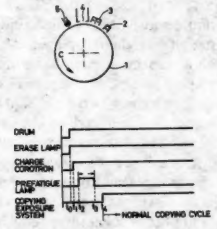
Yoshinki Takahashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 3, 1982, Ser. No. 404,744

Claims priority, application Japan, Aug. 3, 1981, 56-122324

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **4 Claims**



1. A preconditiong method for a rotating photosensitive recording drum of a photocopying machine, comprising the consecutive steps of:

erasing uniformly a full copying portion of said photosensitive drum by energizing an erase lamp;

charging uniformly a full copying portion of said photosensitive drum, and

energizing a prefatigue lamp to expose uniformly a full copying portion of said photosensitive drum to infrared and visible rays, all said steps being performed prior to recording of an image on said photosensitive drum and erasing and charging said drum for said recording.

4,621,921

ORIGINAL FEEDING APPARATUS

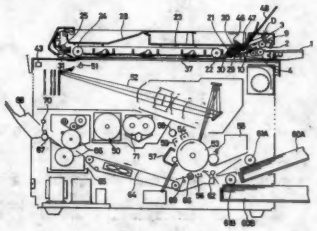
Naomi Takahata, Yokohama, and Takeshi Honjo, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,858

Claims priority, application Japan, Aug. 5, 1983, 58-142439; Aug. 5, 1983, 58-142440; Aug. 5, 1983, 58-142441; Aug. 5, 1983, 58-142442; Aug. 5, 1983, 58-142443; Aug. 5, 1983, 58-142444; Aug. 5, 1983, 58-142445; Aug. 5, 1983, 58-142446

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 SH **18 Claims**



1. An image forming apparatus comprising:

original feeding means for feeding an original to a predetermined position;

image forming means for forming on a recording medium an image of the original at the predetermined position;

first detecting means for detecting transfer abnormality of the recording medium;

second detecting means for detecting the number of originals which must be fed again to the predetermined position by said original feeding means when said first detecting means detects the transfer abnormality of the recording medium;

display means for displaying data associated with an image formation by said image forming means; and

control means for controlling said display means to display the number of originals which must be fed against to the predetermined position in accordance with an output from said second detecting means and, after release of the transfer abnormality, changing the display data.

4,621,922

DEVICE FOR THE PROJECTION COPYING OF MASKS ONTO A WORKPIECE

Werner Tabarelli, Vaduz, and Ernst Löbach, Eschen, both of Liechtenstein, assignors to Perkin-Elmer Censor Anstalt, Vaduz, Liechtenstein

Filed Aug. 10, 1984, Ser. No. 640,085

Int. Cl.⁴ G03B *27/52*

U.S. Cl. 355—41 **16 Claims**

1. An improved device for projection-copying of a mask onto a workpiece, in particular a semiconductor substrate for the production of integrated circuits, in which case the pattern of the mask is projected via a projection lens onto a photosensitive layer of the workpiece in order to align the mask and workpiece relative to one another after alignment patterns of the mask and adjustment areas on the workpiece have been projected onto each other by means of an adjustment light through the projection lens, the improvement comprising an auxiliary optical system positioned out of symmetry with the projection lens to receive adjustment light coming only from a

sub-area of the workpiece which includes at least one adjustment area, said auxiliary lens system including a device for correcting chromatic aberration caused by said adjustment light.

4,621,923

PRODUCTION OF PRINTS

Bruce R. Connell, Collaroy Plateau, Australia, assignor to Oberview Pty. Ltd., Artarmon, Australia

Filed Sep. 20, 1985, Ser. No. 778,089

Claims priority, application Australia, Sep. 21, 1984, PG7249

Int. Cl.[4] G03B *27/52*; G03C *3/00*

U.S. Cl. 355—133 **5 Claims**

1. A print assembly comprising a first image being a colour reproduction having the appearance of an image of normal density and colour for viewing by reflected light, and an identical second image arranged behind and in exact register with the first but being under exposed or of lesser density in relation to the first.

4,621,924

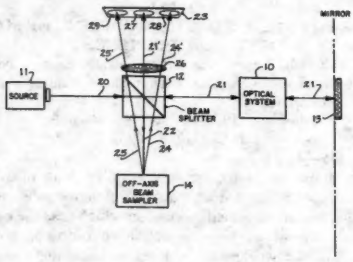
OPTICAL ALIGNMENT APPARATUS

Samuel G. L. Williams, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 17, 1984, Ser. No. 682,620

Int. Cl.[4] G01B *11/26*

U.S. Cl. 356—153 **8 Claims**



1. An apparatus for use in aligning optical elements of an optical system along an optic axis of said system, said apparatus comprising:

(a) a first beam splitter for dividing an optical input beam into a transmitted component and a reflected component, said first beam splitter introducing said transmitted component of said input beam into said system on said optic axis;

(b) an optical flat for returning said transmitted component of said input beam through said system to said first beam splitter for reflection of a portion of said transmitted component of said input beam away from said optic axis as a return beam, said return beam being collinear with but having a direction opposite to said reflected component of said input beam.,

(c) detector means disposed to intercept said return beam; and

(d) a beam sampling device disposed to intercept said reflected component of said input beam, said beam sampling device generating two angularly separated beams and returning said two angularly separated beams to said first beam splitter, said first beam splitter transmitting a portion of each of said two angularly separated beams to said detector means, said detector means indicating angular deviation of each of said angularly separated beams from said return beam, a difference between the angular deviations of said two angularly separated beams from said return beam being a measure of misalignment of the optical elements of said system.

4,621,925

FIBER-OPTIC GYRO

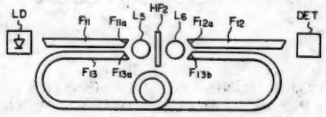
Shigefumi Masuda, Yokohama, and Takeo Iwama, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 20, 1983, Ser. No. 534,126

Claims priority, application Japan, Nov. 11, 1982, 57-198058; Jan. 14, 1983, 58-004409

Int. Cl.[4] G01B *9/02*; G01C *19/64*

U.S. Cl. 356—350 **15 Claims**



1. A fiber-optic gyro comprising

a laser diode,

a light detector,

a half-mirror,

first and second lenses arranged on both sides of said half-mirror, and

first and second optical fibers each having two ends, a respective first of said ends of each of said fibers being aligned with a respective end of the other fiber, and said half-mirror being interposed between said aligned ends,

a third optical fiber having two ends, said third optical fiber being arranged in a coil and so that said two ends are arranged to be parallel to respective portions of said first ends of the first and second optical fibers,

wherein light from the laser diode is incident on the half-mirror through the first lens to produce two light beams, the first of said light beam being reflected from the half-mirror and incident on a first one of said ends of the third optical fiber through the first lens, and the second light beam being transmitted through the half-mirror and incident on the other end of the third optical fiber through the second lens, so that said light beams are propagated through the third optical fiber in opposite directions, and

means for synthesizing the light beams from the third optical fiber into a combined beam that is incident on the light detector,

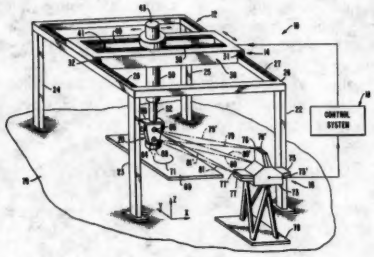
wherein the speed of the rotation angle is detector by the output of the light detector.

4,621,926

INTERFEROMETER SYSTEM FOR CONTROLLING NON-RECTILINEAR MOVEMENT OF AN OBJECT

J. Bradford Merry, and Lawrence B. Brown, both of Annapolis, Md., assignors to Lasercon Corporation, Lanham, Md.

Filed Apr. 30, 1985, Ser. No. 729,106
Int. Cl.[4] G01B 11/00
U.S. Cl. 356—363 11 Claims



8. A method for controlling the movement of an object through a predetermined non-rectilinear path in a predetermined volume having X, Y and Z axes, comprising the steps of

storing the predetermined X, Y and Z spacial coordinates of the predetermined path,

positioning the object in the predetermined volume with a retroreflector rigidly coupled thereto,

directing three laser beams incident on the center of the retroreflector from three laser interferometers rigidly positioned relative to one another and to the predetermined volume,

generating an output signal from the laser interferometers representing the actual location of the retroreflector and object,

comparing the actual location of the retroreflector and object with the desired location along the predetermined path,

moving the object from its actual location to the next desired location along the predetermined path,

redirecting the three laser beams incident on the center of the retroreflector, and

continuously repeating the generating, comparing, moving and redirecting steps until the object has traversed the entire predetermined path.

4,621,927

MIXTURE CONTROL APPARATUS AND MIXTURE CONTROL METHOD

Kazuo Hiroi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 25, 1985, Ser. No. 694,995
Claims priority, application Japan, Feb. 1, 1984, 59-16851
Int. Cl.[4] B01F 15/04
U.S. Cl. 366—132 20 Claims

1. A mixture control apparatus for mixing two fluids having different process variables to obtain a third fluid having a desired process variable, comprising:

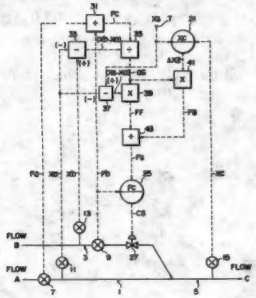
flow rate detecting means for detecting the flow rate of the third fluid;

gain correction quantity calculating means for detecting process variables of the first and second fluids, receiving an output signal from said flow rate detecting means, and for calculating a gain correction quantity in accordance with the difference between the process variables of the first and second fluids and with the flow rate of the third fluid;

set point variable input means for receiving a set point variable which is externally supplied for the process variable of the third fluid;

feed forward control signal generating means for receiving an output signal from said gain correction quantity calculating means and the set point variable of the process variable of the third fluid which is generated from said set point variable input means, detecting the process variable of the first fluid, and for generating a feed forward control signal in accordance with the gain correction quantity, the set point variable of the process variable of the third fluid and the process variable of the first fluid;

feedback control signal generating means for detecting the process variable of the third fluid, receiving the set point



variable of the process varible of the third fluid and the output signal from said gain correction quantity calculating means, and generating a feedback control signal in accordance ith the process variable of the third fluid, the set point variable of the process variable of the third fluid and the output signal from said gain correction quantity calculating means; and

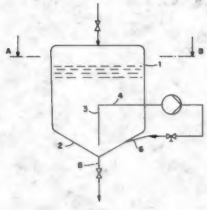
flow controlling means for controlling mixing quantities of the first and second fluids in accordance with the feed forward control signal and the feedback control signal.

4,621,928

TREATMENT SYSTEM AND METHOD FOR FLUIDS CONTAINING PARTICULATE MATTER

Georg Schreiber, Cologne, Fed. Rep. of Germany, assignor to VLT Gesellschaft fur Verfahrenstechnische Entwicklung mbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 20, 1985, Ser. No. 714,077
Int. Cl.[4] B01F 15/02
U.S. Cl. 366—137 10 Claims



1. Apparatus for use in the treatment of liquids containing entrained particulate matter, said apparatus comprising vessel means, said vessel means including a vertical cylindrical section and an axially aligned converging base section coupled to the lower end of the cylindrical section, a fluid supply conduit, an outlet for liquid having a high concentration of suspended particulate matter, a conduit for the discharge of liquid having a concentration of suspended particulate matter less than that discharged through said outlet from the vessel means, at least

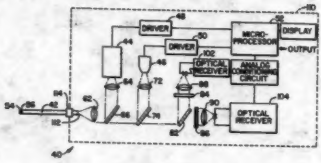
one conduit for the tangential reintroduction of liquid withdrawn from the vessel means, an axial immersion tube with an intake opening, said immersion tube being connected to said discharge conduit whereby liquid will be withdrawn from the region of the axis of said vessel means, and pump means for delivering the withdrawn liquid to said reintroduction conduit for reintroduction into the vessel means tangentially and at an angle relative to the axis thereof and at a position not lower than the intake opening of said immersion tube.

4,621,929

FIBER OPTIC THERMAL ANEMOMETER

Stephen R. Phillips, Walnut Creek, Calif., assignor to Luxtron Corporation, Mountain View, Calif.

Filed Oct. 12, 1983, Ser. No. 541,384
Int. Cl.[4] G01N *25/20*; G01J *5/48*
U.S. Cl. 374—43 **79 Claims**



1. An apparatus for testing the heat transfer coefficient of a sample in an environment comprising:

an element having temperature sensitive optical properties and being adapted to contact or to be implanted in the sample;

radiation heat transfer means for directly supplying heat to the element;

means for transmitting electromagnetic radiation to said element; and

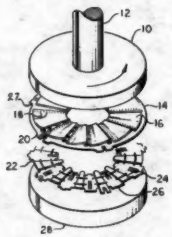
means for optically detecting said temperature sensitive optical properties of the element to test the heat transfer coefficient of the sample, whereby the difference between the temperature of the element and that of the environment is an indication of the heat transfer coefficient of the sample.

4,621,930

FOIL THRUST BEARING COOLING

Alston L. Gu, Rancho Palos Verdes, and Marshall P. Saville, Lawndale, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 1, 1984, Ser. No. 656,399
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—105 **26 Claims**



9. A fluid thrust bearing comprising:

a thrust runner;

a thrust plate to rotatably support the thrust runner;

a compliant foil bearing operably disposed between said thrust runner and said thrust plate and mounted on said thrust plate, said compliant foil bearing including a thrust disk having a plurality of circumferentially spaced, compliant foils each individually mounted, along the leading edge thereof, on said thrust disk and extending towards said thrust runner, and a foil stiffener disk having a plurality of upper and lower ridges alternately transversely disposed therearound between the thrust disk and the thrust plate; and

a plurality of openings in said thrust disk to direct the flow of a cooling fluid from between the thrust disk and the thrust plate to between the thrust disk and the thrust runner,

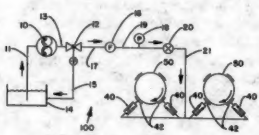
said plurality of openings in said thrust disk including a generally radially extending row of openings positioned directly beneath the trailing edge of one of said compliant foils.

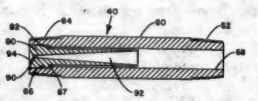
4,621,931

METHOD APPARATUS USING A CAVITATING VENTURI TO REGULATE LUBRICANT FLOW RATES TO BEARINGS

Richard C. Jensen, Greensburg, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Dec. 19, 1983, Ser. No. 562,613
Int. Cl.[4] F16C *17/02, 17/12, 33/10*
U.S. Cl. 384—114 **3 Claims**





1. A feed system for supplying liquid lubricant at constant flow rates to reduce startup and low speed shaft torque in turbomachinery which comprises:

a plurality of hydrostatic bearings for supporting a shaft;

common means for supplying high pressure liquid lubricant through a common discharge line; and

a plurality of cavitating venturis, one cavitating venturi connected to each hydrostatic bearing and all of said cavitating venturis being connected to receive liquid lubricant from the common discharge line for supplying liquid lubricant and for regulating the flow rate of liquid lubricant to each bearing for supporting the shaft regardless of the downstream pressure conditions acting on the bearing.

4,621,932

FOUR-ROW CYLINDRICAL ROLLER BEARING FOR THE WORKING OR BACK-UP ROLLS OF HIGH-SPEED ROLLING STANDS

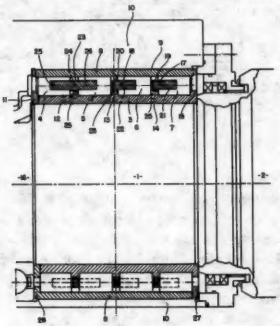
Walter Küfner, and Heinrich Winter, both of Schweinfurt, Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 5, 1985, Ser. No. 772,689

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3432875

Int. Cl.[4] F16C *19/28*

U.S. Cl. 384—569 5 Claims



1. Four-row cylindrical roller bearing comprising inner and outer spaced rings and a plurality of rows of rollers in the annular space between the rings, said inner ring having flanges (11, 12, 13, 14) on both sides of each row of rollers (4, 5, 6, 7) and in the installed state, at least two rows of rollers (6, 7) facing a roll body (2), each being guided in a separate cage.

4,621,933

LINE SPACING MECHANISM FOR PRINTING MACHINES

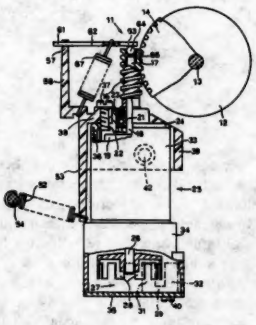
Pietro Musso, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Sep. 17, 1984, Ser. No. 651,317

Claims priority, application Italy, Sep. 29, 1983, 68001 A/83

Int. Cl.[4] B41J *19/96, 19/14;* F16H *55/18, 1/16*

U.S. Cl. 400—555 7 Claims



1. A line spacing mechanism for printing machine comprising a platent having a helicoidally toothed wheel connected coaxially with the platen, a worm engageable with the helicoidally toothed wheel to produce the rotary movement of the platen, an electric motor including a motor shaft which rotates the worm, a coder unit for controlling the angular position of the worm, the motor shaft comprising a first end on which is fixed the worm and a second end on which is fixed the coder unit, wherein the worm is disposed opposite to the coder unit and the electric motor is disposed between the worm and the coder unit, a container for housing the electric motor and the coder unit and wherein the worm projects from the container, a pivotable support in which is mounted said container, pivot means disposed parallel to the platen for pivotally mounting said pivotable support, and means for taking-up radial play and axial play for holding the worm engaged with the helicoidally toothed wheel, said means for taking-up radial play and axial play comprising first spring means for pivoting the pivotal support about said pivot means until the worm is fully meshed with the helicoidally toothed wheel so as to reduce the radial play between the worm and the helicoidally toothed wheel and second spring means operative on said worm and on said first end as to reduce the axial play between the worm and the container.

4,621,934

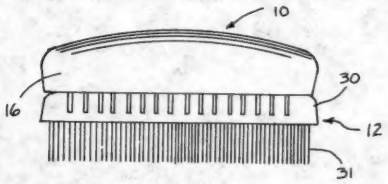
INTEGRATED SOAP BAR AND BRUSH

Daniel A. Starek, 484 B Prospect Creek, Manchester, Mo. 63011

Filed Aug. 5, 1985, Ser. No. 762,272

Int. Cl.[4] A46B *11/00*

U.S. Cl. 401—19 12 Claims



1. An integrated soap bar and brush, said brush comprising a body having bristles depending therefrom, said soap bar being molded in situ over an insert embeded in said soap bar, said insert comprising a base extending substantially coextensive with a top surface of said brush body along a bottom portion of the soap bar, said base supporting said soap bar independently of said brush body, said base being affixed to said brush body and said insert further comprising rib members extending from said base through the soap in a three dimensional fashion to provide a longitudinal, transverse and vertical framework.

4,621,935

METHOD OF FILLING A COSMETIC CONTAINER WITH PUSH-UP ACTUATOR

Morris Sussman, Freeport, N.Y., assignor to Shore Plastics Inc., Freeport, N.Y.

Filed Oct. 16, 1980, Ser. No. 197,496

Int. Cl.[4] B43K *21/00*

U.S. Cl. 401—82 1 Claim

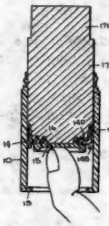
1. The method of filling and sealing a container with a liquefied cosmetic having a high alcohol content, said container having an open-ended cylindrical case whose upper end is externally threaded to receive a screw-on cap and whose bottom end is provided with an inwardly directed lip on which a push-up actuator rests, the actuator having a base provided with a filling hole having a predetermined diameter, the method comprising the steps of:

A. pouring the liquefied cosmetic into the hole with the container upside down until the level of liquid in the container reaches the actuator, at which point the container is filled;

B. cooling a plug formed of a plastic material having a high thermal coefficient, said plug having a raised ring on its

inner face which when the plug is cold has a diameter slightly smaller than that of the hole;

C. dropping said cold plug onto the base of said upside-down container to cause the ring to fall into said hole, the ring



thereafter expanding when it reaches ambient temperature to seal said hole; and

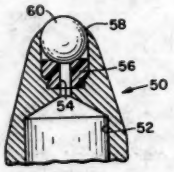
D. placing the sealed and filled container in an upright position to permit the liquefied cosmetic to solidify.

4,621,936

ZIRCONIA PEN BALLS

John N. Hansson, Chagrin Falls, and Herbert L. Johns, Madison, both of Ohio, assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 14, 1983, Ser. No. 542,315
Int. Cl.⁴ B43K *1/08, 7/00;* **C04B** *35/48*
U.S. Cl. 401—215 **9 Claims**



1. A liquid transfer device including a hollow tip, adapted to be placed in communication with a liquid container, and a liquid transfer ball seated in said hollow tip in protruding relation, said liquid transfer ball formed of a ceramic comprising zirconium oxide as the major analytic constituent of the ceramic and being at least partially stabilized by a stabilizer, and said ball having a porosity of less than about 8 percent by volume as determined by optical image analysis of a polished section.

4,621,937

SELF-RETAINING ANCHORING ASSEMBLY AND SEAL THEREFOR

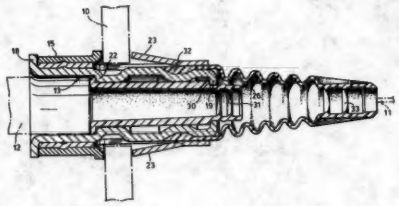
Stuart J. Maccuaig, 117 St. Vincent Street South, Stratford, Ontario, Canada (N5A 2W9)

Filed Feb. 18, 1986, Ser. No. 830,352
Int. Cl.⁴ F16D *9/00*
U.S. Cl. 403—197 **7 Claims**

1. A self-retaining anchoring assembly for mounting a coaxial cable within a throughbore defined in a support member, the coaxial cable including concentrically arranged inner and outer cable members, comprising:

inner and outer concentrically arranged sleeve members providing cooperating abutment means at one end, and an annular collar mounted concentrically about the outer sleeve member adjacent said one end in fixed relation thereto, the outer sleeve member providing a plurality of integral, circumferentially spaced resilient external prongs extending towards said one end and spaced from the annular collar by a distance equal to the thickness of the support member whereby to retain the assembly in the throughbore with the annular collar and the ends of the prongs engaging respectively opposite faces of the support member, and

a first annular seal of resilient flexible material arranged concentrically with the sleeve members and extending



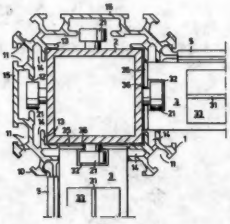
from the other end thereof, said first annular seal providing a first annular end portion clamped between said inner and outer sleeve members, a second annular end portion providing internal sealing means positioned to engage the inner cable member in wiping relation thereto, and an intermediate portion extending from the first annular portion to the second annular portion and formed with integral annular corrugations.

4,621,938

JOINT

Gerth Wellow, Södertälje, Sweden, assignor to Hennix i Stockholm AB, Sundbyberg, Sweden

PCT No. PCT/SE85/00175, § 371 Date Dec. 13, 1985, § 102(e) Date Dec. 13, 1985, PCT Pub. No. WO85/04921, PCT Pub. Date Nov. 7, 1985
PCT Filed Apr. 16, 1985, Ser. No. 829,132
Claims priority, application Sweden, Apr. 17, 1984, 8402143
Int. Cl.⁴ E04B *1/24, 1/58;* **F16B** *12/42;* **A47B** *96/14*
U.S. Cl. 403—217 **10 Claims**



1. A joint between a vertically oriented hollow section column **(1)** and a horizontal beam **(3)** carrying structural flooring in a two-storey building structure, such as an exhibition stand which can be rapidly erected and dismantled, the joint including a straight quadratic core **(2)** which is fitted into the upper end of the generally quadratic hollow section column **(1)** and which has a screw **(21)**, the head of which engages with the beam, characterized in that the side walls of the column **(1)** each have on their insides a central, axial slot **(12)**, that the beam **(3)** at its connection end has a central guide body dependent from its lower surface, the width of the body substantially corresponding to the width of the internal slot **(12)** of the column **(1)** and the length of which in the direction of the beam is less than the depth of the column slot **(12)** so that the body **(37)** is accommodated in the slot **(12)** when the beam end engages against the side surface of the core **(2)**, in that the beam

(3) has its lower surface bearing against the upper square cut end of the column (1), with the end surface of the beam abutting the core, the axis of the beam intersecting the axis of the column (1) and in that the short end of the beam (3) has a vertically directed Tee slot (32,36) extending upwardly from the central area of the beam (3) and through the upper surface of the beam, whereby the beam may be fixed to the column (1) by the beam being placed on the upper edge of the column with the body (37) in the internal central slot (12) of the column, whereafter the core (2) is thrust down into the column so that the screw head on the core is taken down into the Tee slot (32,36) of the beam end, whereafter an optional, further column (101) can be placed over the end of the core (2) upstanding above the beam (3).

4,621,939

DRAINAGE CHANNEL

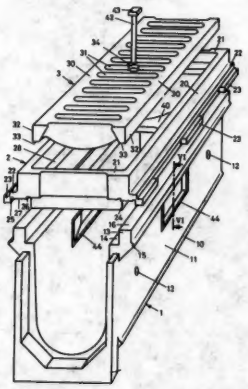
Roland Thomann, Langnau; Heinz Witschi, Adligenswil; Heinz-Dieter Brink, Mattstetten, and Markus Amann, Langnau, all of Switzerland, assignors to Polydrain, Inc., Troutman, N.C.

Filed Nov. 21, 1983, Ser. No. 553,592

Claims priority, application Switzerland, Nov. 23, 1982, 6826/82; Oct. 18, 1983, 5662/83

Int. Cl.⁴ E01C *11/22*

U.S. Cl. 404—4 **2 Claims**



1. A drainage channel assembly comprising:

(a) an elongated U-shaped channel body formed of opposing spaced-apart side walls connected on one end to define a closed bottom and open on the opposite end to define an open top;

(b) a rectangular frame for being positioned on the open top of the channel body over and supported by the channel body side walls, wherein the side walls for supporting the frame are provided with outer elevated supporting ribs and inner lower shoulders, and said frame is provided with a lower supporting shoulder at its inner side for supporting side ribs of a grate for being positioned in the rectangular frame;

(c) break lugs carried by said frame and positioned in overlapping relation to the supporting ribs of the side walls of the channel body; the upper part of the side walls of the frame being vertical, with a horizontally protruding side rib which extends above said side wall over the whole length of the frame, which break lugs are attached in a horizontal and protruding manner over said side rib and having at the connecting area between said side rib and said break lugs a predetermined breaking line of reduced thickness to permit removal of the lugs by striking with a sharp blow.

4,621,940

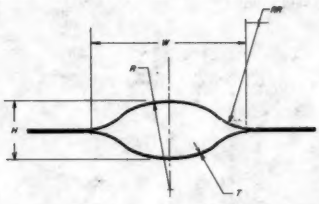
STIFF BUT BENDABLE ELONGATED PLASTIC ARTICLE

Howard A. Anderson, Pittsburgh, Pa., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 20, 1984, Ser. No. 652,788

Int. Cl.⁴ E01F *9/00*

U.S. Cl. 404—10 **8 Claims**



7. A highway delineator comprising an extruded elongated article which displays substantial resistance to bending or twisting but can be bent 90° across its longitudinal axis and across the plane of juncture of its faces without suffering significant plastic deformation, said article

(1) being constructed of a rigid thermoplastic material capable of substantial elastic deformation,

(2) having the shape of two sheets which

(a) each has two parallel longitudinal edges,

(b) each has the configuration of an arc with wings in its shorter dimension,

(c) are joined to each other along both of their longitudinal edges,

(d) define a lens shape in the cross-section perpendicular to their longitudinal axis which has a width between about 2 and 4 times its height and has wings extending in the plane of juncture of the sheets for a distance of between about 0.25 and 0.75 times the width of the lens shape, and

(e) each has a reverse curvature just before the point of juncture of a radius both at least fifteen times the thickness of the sheet and sufficient to allow its interior surface to meet the interior surface of the other sheet without significant plastic deformation when the article is bent 90° across its longitudinal axis and across the plane of said juncture, and

(3) being able to withstand the impact of a vehicle bumper at 50 miles per hour which causes it to bend 90° across its longitudinal axis and across the plane of juncture of these sheets.

4,621,941

MANHOLE RISER HAVING INTEGRAL FLEXIBLE WATERLOCK FOR MANHOLE COVERS AND HAVING A WATER TIGHT SEAL FOR SEALED MANHOLE COVERS

Jack Ditcher, Langhorne; Eric Ditcher, Bensalem, and James A. Westhoff, Langhorne, all of Pa., assignors to A-Lok Products, Inc., Tullytown, Pa.

Filed Sep. 25, 1985, Ser. No. 779,845

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.⁴ E21D *29/14*

U.S. Cl. 404—26 **30 Claims**

1. Apparatus for providing a water-tight seal in the region above the riser section of a manhole structure comprising:

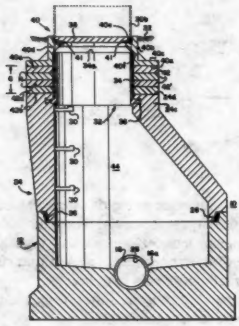
resilient, compressible, bendable sleeve means having an outwardly extending integral projection cast into the top portion of said riser section, the portion of the sleeve means adjacent said projection extending into and being adjacent to the interior surface of the riser section adjacent the top end thereof, the outer diameter of the riser

section at the top end being greater than the outer diameter of the projection;

a manhole cover support frame with an integral annular upper flange for supporting a manhole cover and an integral lower supporting flange;

at least one grade ring arranged between the lower supporting flange of said manhole cover support frame and the top surface of said riser section and extending over the top surface of said riser section;

said support frame lower supporting flange being arranged upon said grade ring;



said sleeve means extending upwardly from said integral projection to extend above said riser section, through said grade ring and into said manhole cover support frame and above the lower supporting flange and adjacent to and below said upper flange to prevent subsurface water, which may seep into the region between said frame and riser section, from entering into the interior of said manhole structure;

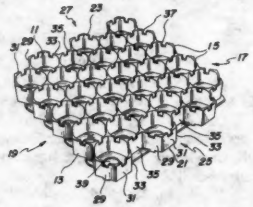
the sleeve means having a diameter sufficient to permit ingress into and egress from the manhole structure by a person without moving the sleeve means.

4,621,942

GRASS PAVING STRUCTURE

Ronald F. Hill, Huntington Beach, Calif., assignor to Bartron Corporation, Laguna Hills, Calif.

Filed Sep. 27, 1984, Ser. No. 655,504
Int. Cl.[4] E01C *5/20, 15/00*
U.S. Cl. 404—41 **7 Claims**



6. A hexagonal cell structure for installation with an identically formed structure, the hexagonal cell structure having sawtooth sides along first respective opposite sides and a series of spaced apart, half hexagons on second respective opposite sides; and

a base means underlying said hexagonal cell structure;

said base means, along first respective opposite sides being contoured as complementary half-hexagonal periodic shapes such that a portion of each half-hexagon extends beyond said base means, thereby providing a half hexagonal extension, and such that said base means provides a surface means between each adjacent half-hexagon for receiving an overlying half hexagonal extension of said identically formed structure;

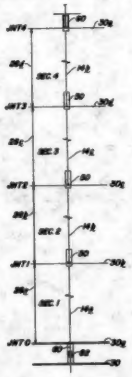
said base means, along second respective opposite sides, being contoured as complementary arcuate undulations such that a portion of each sawtooth extends beyond said base means, thereby providing a sawtooth extension, and such that said base means provides a surface means between each adjacent sawtooth for receiving an overlying sawtooth extension of said identically formed structure; whereby when one hexagonal cell structure is positioned adjacent to another, they interlock and support each other in one plane and support each other in another plane.

4,621,943

CONTINUOUS PRESTRESSED CONCRETE AND METHOD

David T. Swanson, Saratoga, Calif., assignor to VSL Corporation, Los Gatos, Calif.

Filed Oct. 9, 1984, Ser. No. 658,542
Int. Cl.[4] E01C *5/10, 11/20*
U.S. Cl. 404—70 **14 Claims**



1. A highway construction comprising a sub-base, an elongated concrete slab having a plurality of segments resting on the sub-base, a plurality of continuous tendons extending longitudinally of the slab positioned in said concrete and spaced across the width thereof, a plurality of slots at predetermined locations within said slab adjacent the ends of said segments and extending longitudinally of the slab formed across the width of said slab to expose said tendons at spaced longitudinal locations between opposite ends of the slab, positioning at said slots means for anchoring and engaging said tendons to tension said tendons at said slots, whereby compressive portions are formed in said segments including portions between said slots.

8. A method of forming a prestressed post-tensioned slab having a plurality of segments each including continuous longitudinal tendons comprising the steps of: placing a plurality of longitudinally extending transversely spaced continuous tendons in a form; pouring concrete over said tendons and selectively forming at spaced locations intermediate the ends of the slab at least one longitudinal extending slot in said concrete around each of the tendons to allow access to an intermediate portion of said tendons at a location between the ends of the slab, forming said slot to be narrower in transverse width than the transverse width of the slab; positioning at said slots means for anchoring and engaging said tendons to tension said tendons, and pouring concrete in the spaces between said slots to form a plurality of slab segments each with at least a portion

thereof continuous from end to end whereby compressive portions of said slab are formed in said segments including the transverse portions between said slots, allowing said concrete to at least partially set and thereafter tensioning said tendons by engaging said tendons at said slots.

4,621,944

RAPID REPAIR OF RUNWAYS

Antonius P. M. Jordense, Elst, Netherlands, assignor to 501 Bruil-Arnhem Groep B.V., Netherlands

Filed Nov. 30, 1984, Ser. No. 677,083

Claims priority, application Netherlands, Nov. 7, 1983, 8304230

Int. Cl.[4] E01C *19/15, 5/10, 19/50*

U.S. Cl. 404—75 **14 Claims**

1. The method of making rapid repair of a crater-damaged aircraft runway, which comprises the steps of:

(a) enlarging the surface level area of the damaged surface in surrounding relation to the crater-damaged region of the runway to form an an enlarged crater whose surface level area is enlarged to a rectangular area of predetermined width and length;

(b) filling in the enlarged crater with fill material in amount sufficient to fill in said enlarged crater to a level near that of the undamaged surface;

(c) conforming to and preserving the contour of the undamaged runway surface leading to said rectangular area and striking off fill material from within the rectangular area to define a depressed contour of fill material within said rectangular area conformed to and parallel with the contour of the undamaged surface leading to said rectangular area; and

(d) laying tiles in contiguous relationship to one another onto said depressed contour of the fill material to completely cover said rectangular area and provide a repaired landing surface area therewith which is at substantially the same level and contour as said undamaged surface leading to the rectangular area.

8. Apparatus for effecting rapid repair of crater-damaged aircraft runway surfaces, which comprises an elongate carrier, movable support means at each end of said carrier for moving the carrier in a direction transverse to the longitudinal axis of the carrier, each movable support means comprising a first set of wheels connected by a first beam and a second set of wheels connected by a second beam, means for rocking said beams independently about an axis perpendicular to the length of said carriage and parallel with said direction, adjusting means carried by said support means for raising and lowering each end of the carrier with respect to the surface upon which said movable support means rest, a plurality of strike-off blades disposed in end-to-end relation and pairs of position adjusting means carried by said carrier for independently raising and lowering each end of each blade, and guide means for maintaining said blades in end-to-end relation, each of said strike-off blades being separate from and completely independently adjustable with respect to all the other blades, each of said blades having a pair of spaced substantially vertical slots formed therethrough, said guide means including a plurality of guide members extending loosely through said slots so that the plates can move a substantial distance in a vertical direction and also a limited amount rotationally with respect to said guide members so as to allow the composite strike-off edge defined by such blades to conform to the contour of the undamaged runway surface.

4,621,945

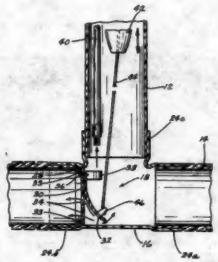
HEAD CONTROL STAND

Christopher E. Schafer, 507 Guthrie, Adair, Iowa 50002; William P. Schafer, Menlo, Iowa 50164, and Charles J. Schafer, Rte. 2, Adair, Iowa 50002

Filed Jan. 11, 1985, Ser. No. 690,581

Int. Cl.[4] E02B *11/00, 13/00*

U.S. Cl. 405—39 **3 Claims**



1. A head control stand for the selective control of an underground water table and the water flow within a subsurface drainage-irrigation tile system in association with a subsurface drainage-irrigation tile system having a drain tile passing through the ground, comprising:

a riser pipe coupled at one end to the drain tile and extending in a generally upright direction;

a junction for coupling the riser pipe to the drain tile, the junction having three couplings, a first upstream coupling connected to a section of drain tile into which water flows, a second downstream coupling connected to a second section of drain tile, the water entering the junction from the first coupling and flowing through the second coupling into the drain tile, a third coupling connected to the riser pipe, the water entering the riser pipe through the third coupling and rising within the riser pipe to a level corresponding to the water table level in the immediate surrounding area;

a valving means removably disposed within the junction for selectively allowing water to flow within the drain tile including a metering plate and a flap, the metering plate sealingly extending across the second coupling and includes apertures, the apertures permitting water to flow through the metering plate, the flap being constructed of flexible material and secured to the metering plate at its top and extending downwardly over the metering plate in a normally closed position covering the apertures to prevent the flow of water therethrough, a bracket, the bracket attached to the lower portion of the flap and extending outwardly therefrom;

actuating unit, the actuating unit located within the riser pipe and includes a float, the float connected to the flap via the bracket such that upon the water table rising, water within the riser pipe will rise and the float will move upward and the flap will be correspondingly pulled away from the metering plate, permitting water within the drain tile to flow through the metering plate and upon the water table lowering, the water level within the riser pipe will lower with the float moving downward and the flap will be correspondingly moved towards the metering plate affectively reducing the flow of water through the metering plate.

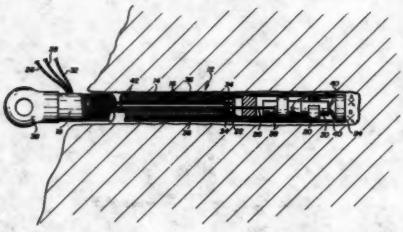
4,621,946
METHOD AND APPARATUS FOR MOVING ICE MASSES

Ronald D. Page, Newfoundland, Canada, assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 536,799, Sep. 28, 1983, abandoned. This application Apr. 8, 1985, Ser. No. 721,129

Int. Cl.[4] E02B *1/00*; B63B *21/56*

U.S. Cl. 405—61 24 Claims



1. An apparatus for towing an iceberg or ice mass by a marine vessel comprising:

an anchor means having a deployment end and a drill end for insertion into said iceberg or ice mass at a point near the center of gravity of said iceberg or ice mass;

a drill means rotatably mounted on said anchor means for providing a hole in said iceberg or ice mass;

a freezing means in said anchor means for freezing said anchor means to said iceberg or ice mass;

a deployment means associated with said anchor means for advancing said anchor means into said hole in said iceberg or ice mass; and

a connection means fixed to said anchor means for receiving a tow line connected to a marine vessel.

4,621,947
METHOD OF AND APPARATUS FOR THE LINING OF A TUNNEL WITH CONCRETE

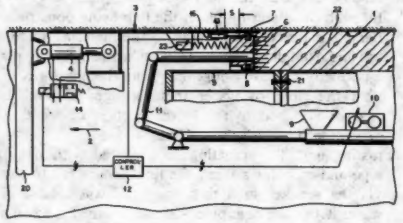
Siegmund Babendererde, Bad Vilbel, and Gunnar Lah, Erzhausen, both of Fed. Rep. of Germany, assignors to Hochtief Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,002

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406980

Int. Cl.[4] E21D *9/06*, *11/10*

U.S. Cl. 405—146 6 Claims



1. A method of constructing a tunnel which comprises the steps of:

excavating a tunnel and progressively advancing a shield along a tunnel wall as it is formed in a direction of tunnel advance;

juxtaposing with said shield and inwardly thereof a concrete form having an outer surface defining with said shield and as a portion of said tunnel wall behind said shield a space along said tunnel wall;

bounding said space in said direction by a movable wall disposed between said shield and said form;

pumping concrete into said space to line said tunnel wall with a pressure sufficient to advance said wall at least in part independently of the advance of said shield by the pressure of the concrete supplied to said space;

mounting said movable wall for limited movement in said direction on said shield and controlling the pumping of said concrete and the advance of said shield so that the displacement of said movable wall is effected in a region between limiting positions of said movable wall on said shield solely as a result of the force exerted by the pumped concrete exceeding resistance to movement of said movable wall; and

interrupting the supply of concrete to said space upon said movable wall reaching a forward limiting position on said shield and interrupting advance of said shield upon said movable wall reaching a rearward limiting position on said shield.

4,621,948
TUNNEL LINING FORM

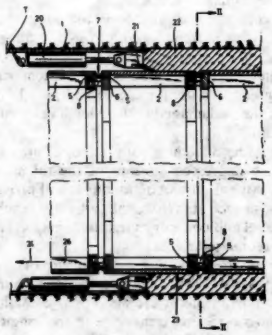
Volker Hentschel, Dorsten, Fed. Rep. of Germany, assignor to Hochtief Ag Vorm. Gebruder Helfmann, Essen, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,775

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342220

Int. Cl.[4] E21D *9/06*

U.S. Cl. 405—146 11 Claims



1. In combination with a tunneling machine which excavates a tunnel in a subterranean structure and provided with means for lining a wall of the tunnel immediately beind the machine with concrete, a removable tunnel casing adapted to be emplaced behind said machine to define a space with said wall to be filled with concrete, said casing commprising:

a plurality of removable segmented generally cylindrical tunnel casing sections disposed substantially in axially end-to-end relation and formed with respective annular flanges at the axial ends of said sections whereby proximal flanges of successive casing sections define the respective joint forming a gap with a variable gap width, said casing sections being removably disposed in said tunnel such that a section can be moved from an upstream end of the casing to a location immediately behind said machine;

sealing means on at least one of said casing sections at each of said joints for sealing the respective gap against incursion from the direction of a tunnel wall;

respective drawbolts angularly spaced at each of said joints for drawing the proximal flanges thereof toward one

another to varying distances depending upon the path of the tunnel; and

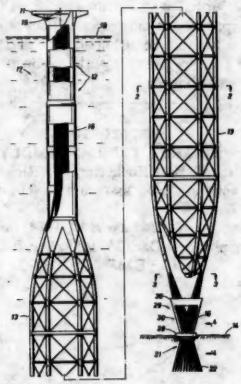
angularly equispaced compression spacers disposed between and axially bridging the proximal flanges at each joint for variably establishing respective spacings between said proximal flanges at the respective spacers and between portions of the proximal flanges and being blockable to maintain the said spacing under compression forces whereby the progressive advance of the casing through said tunnel permits the casing to be oriented to tunnel curves with said sections and being blockable to maintain the said spacing under compression forces.

4,621,949

BUOYANT TOWER FLEXURE JOINT

Peter W. Marshall, and Paul R. Johnson, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 24, 1984, Ser. No. 685,654
Int. Cl.[4] E02B *17/02*
U.S. Cl. 405—202 **14 Claims**



1. For use in offshore well operations, a buoyant tower structure adapted to extend to the bottom of a body of water having a central vertical axis comprising:

a platform adapted to be positioned above the surface of said water;

a buoyant tank means located adjacent the upper end of said tower structure and being located beneath and connected to said platform;

at least three large diameter legs extending downwardly substantially parallel to said central vertical axis from said buoyant tank means a selected distance, said legs being spaced substantially equally about the circumference of said buoyant tower structure and ending at a selected distance above said ocean floor; and

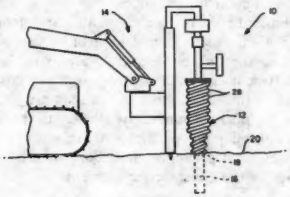
a plurality of pile guides of a diameter less than said legs extending downwardly through and below each of said large diameter legs, the portion of said pile guides extending below said legs curving inward toward each other around the central vertical axis of the lower portion of said tower structure to form a flexure joint housing.

4,621,950

TECHNIQUES FOR ESTABLISHING INGROUND SUPPORT FOOTINGS AND FOR STRENGTHENING AND STABILIZING THE SOIL AT INGROUND LOCATIONS

Frank Kinnan, Camas Valley, Oreg., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Jan. 18, 1983, Ser. No. 458,817
Int. Cl.[4] E02D *37/00*
U.S. Cl. 405—231 **40 Claims**



1. A system for establishing a support footing in the ground around an inground section of a post, comprising:

(a) a generally cylindrical hollow casing having opened top and bottom ends larger in diameter than the maximum width of said post section, an uppermost end section including said top end, a lowermost end section including said bottom end, said lowermost end being smaller in diameter than said uppermost end section, and a radially tapering intermediate section joining said end sections, said casing having a helically threaded outer surface between its ends sufficient to allow the casing to be threaded into the ground around said post section starting at its bottom end; and

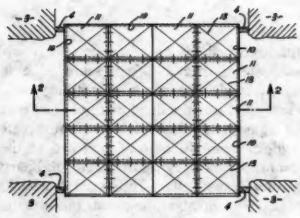
(b) means disengagably connectable with the top end of said casing for rotating the latter about its axis while, at the same time, urging the entire casing forward in the direction of its bottom end, whereby to thread the casing into the ground around said post section starting at its bottom end so that it may serve as said footing.

4,621,951

MODULAR REUSABLE OVERCAST

Frederick J. Dewson, 66 Koloona Avenue, Figtree, New South Wales 2525, Australia

Filed Jul. 31, 1984, Ser. No. 636,275
Claims priority, application Australia, Aug. 2, 1983, PG0606
Int. Cl.[4] E21F *1/00*
U.S. Cl. 405—303 **8 Claims**



1. A mine overcast for ventilation control, said overcast comprising a plurality of edge abutting rectangular construction elements fastened together to form a span extending between support members at each side of the overcast;

said support members each comprising a flat rectangular sheet of cladding braced to resist out of plane deformation extending upwardly from footing means and joined along its upper edge to an upwardly and inwardly extending flat rectangular sheet of cladding braced to resist out of plane

deformation, the free edges of said upwardly and inwardly extending sheet terminating in perforated edge flanges extending substantially perpendicular to said upwardly and inwardly extending sheet, and gusset means traversing the joint between said upwardly extending sheet and said upwardly and inwardly extending sheet to strengthen said joint;

said construction elements comprising a flat rectangular sheet of cladding braced to resist out of plane deformation, and perforated edge flanges extending substantially perpendicular to said sheet;

wherein said construction elements are fastened together in edge abutment to form said span by fastening means extending through aligned perforations in the edge flanges of adjacent elements, and wherein the construction elements forming each end of the span are joined to respective support members by fastening means extending through aligned perforations in the uppermost edge flanges of said support members and the adjacent edge flange of the construction elements.

4,621,952

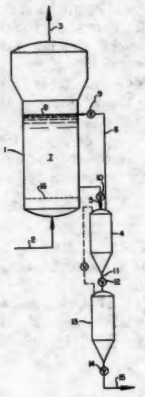
FLUIDIZED BED DISCHARGE PROCESS

Robert G. Aronson, S. Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 287,815, Jul. 28, 1981, abandoned. This application Apr. 3, 1984, Ser. No. 596,366

Int. Cl.[4] B65G *53/16*

U.S. Cl. 406—138 **7 Claims**



1. A fluidized bed discharge process for transferring solid particulate material from a high pressure vessel to lower pressure through successive zones of settling and transferring, wherein said solid is maintained in a fluidized condition by the passage of a gas stream through a distributor plate in said high pressure vessel from the base of said bed to the top of said vessel, comprising: conveying fluidized solid particulate material, by positive gas transfer, from a point in said vessel below the top of said bed and above said distributor plate, through the actuation of suitable valving means, to a settling zone or zones wherein said solid material is separated from said gas which is vented back directly and indirectly into said vessel at a point above the point of conveying; upon the completion of conveying of said solid particulate material to said settling zone, actuating associated valving means to arrest all solid and gas flow to and from said settling zone; and actuating valve means associated with said settling zone to a transfer solid particulate material from said settling zone to a transfer zone or convey the gas from one said settling zone to a second settling zone.

4,621,953

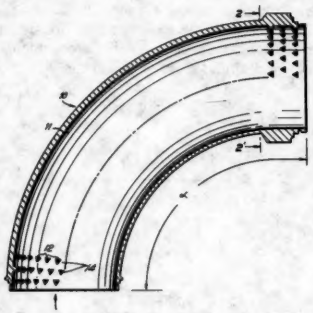
ANTI-EROSION PROTRUSIONS FOR WEAR SURFACES IN FLUID CONDUITS

Joseph C. McGuth, Chatham, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Dec. 14, 1984, Ser. No. 682,127

Int. Cl.[4] B65G *53/52*

U.S. Cl. 406—193 **10 Claims**



1. A conduit for flow of fluids containing abrasive solids, said conduit being a curved elbow and containing a plurality of protrusions attached to a radial outer portion of the elbow interior surface, said protrusions being pyramid-shaped having at least three sides and arranged in a staggered pattern with a leading edge oriented towards the fluid flow direction, whereby the protrusion sides can deflect a flowing fluid to each side, so as to produce turbulent flow of the solids-containing fluid and thereby provide anti-erosion protection for the conduit interior surface.

4,621,954

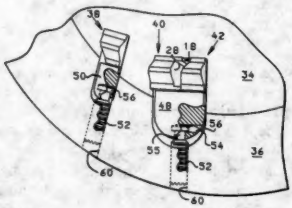
GEAR CUTTER ASSEMBLY

Richard L. Kitchen, East Rochester, and Richard C. Blakesley, Holcomb, both of N.Y., assignors to The Gleason Works, Rochester, N.Y.

Division of Ser. No. 672,741, Nov. 19, 1984, Pat. No. 4,575,286. This application Dec. 23, 1985, Ser. No. 799,218

Int. Cl.[4] B23F *21/12, 21/22*

U.S. Cl. 407—22 **4 Claims**



4. In a face milling type cutting assembly for use in gear cutting operations comprising:

a disc-shaped body having slots for receiving bar stock type cutting tools in positions projecting from a front face thereof;

bar stock type cutting tools being received in said slots;

means securing said bar stock type cutting tools in said slots;

two of said bar stock type cutting tools being contiguously positioned in the same slot and generally aligned to a cutting direction;

one of said two bar stock type cutting tools having a back wall with a recess formed therein for providing cutting

clearance between said two bar stock type cutting tools during use;

said back wall being defined by two abutment surfaces located on either side of said recess for contacting a front wall of the other of said two bar stock type cutting tools; the improvement comprising:

a ring member enclosing the circumference of said disc-shaped body and securing said bar stock type tools therein, said ring member defining a threaded bore therethrough;

a screw element having a shaped head portion and a threaded portion in engagement with said threaded bore; and,

a clamping block having an opening releasably securing said shaped head portion of said screw element, in situ, and having a partially enclosed opening embracing more than one half of the circumference of said screw element in snap-type engagement.

4,621,955

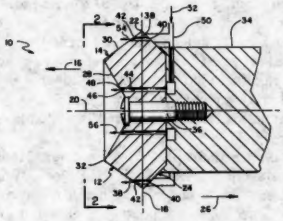
CONE SHAPED CUTTING INSERT

Leonard A. Briese, 5039 Browndeer La., Rancho Palos Verdes, Calif. 90274

Filed Apr. 16, 1984, Ser. No. 600,806

Int. Cl.[4] B23B *27/22*; B23C *5/02*; B26D *1/00*

U.S. Cl. 407—114 **66 Claims**



1. A conical cutting insert comprising, in combination:

a body member, having an outer peripheral surface, a central axis, a median plane substantially perpendicular to said central axis, a first end section extending in a first direction from said median plane and a second end section extending in a second direction, substantially opposite said first direction from said median plane;

said first end section having:

a frusto-conical first inner cutting surface tapering outwardly from said central axis in regions adjacent said median plane toward said outer peripheral surface;

said outer peripheral surface in said first end section defining a frusto-conical first outer flank surface tapering inwardly from regions adjacent said median plane in said first direction toward said central axis; and

said first flank surface intersecting said first inner cutting surface to define a generally circular first cutting edge;

whereby said body member has a substantially increasing thickness from said first cutting edge toward said median plane.

4,621,956

METHOD AND APPARATUS FOR CUTTING OF FLEXIBLE FOAM MATERIAL

Steven D. Hartman, and H. David Hartman, both of 7676 Kimbel Street, Unit 18, Mississauga, Ont., Canada (L5S 1J8)

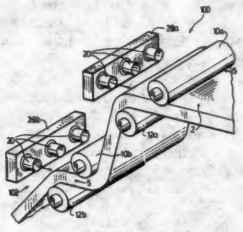
Filed Oct. 1, 1984, Ser. No. 656,181

Int. Cl.[4] B23B *41/00*

U.S. Cl. 408—1 R **16 Claims**

1. A continuous process for cutting a generally cylindrical rod from soft flexible polymeric foam in the form of an elongate slab of predetermined width and thickness including moving the foam slab along a predetermined path towards high speed circular cutters spaced in the width of said slab and spaced from each other,

continuously cutting from within the thickness of such slab a plurality of rods each spaced in the width of such foam a distance at least equal to the diameter of such rods as such slab moves past at least some of said cutters and cutting said foam between said rods and the upper or lower surface of such slab, moving the remaining portion



of such foam along a second predetermined path past further circular cutters positioned to cut additional rods from the remaining portion of such foam slab spaced by a distance approximately equal to the diameter of one of such rods and forcing the remaining portion of such slab to separate from such cut additional rods by moving in a manner such that the remaining portion of such slab is displaced sufficiently from said path and said cut additional rods such that such rods are exterior to such slab.

4,621,957

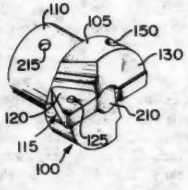
INVERTED CUTTER

Lathe T. Dillard, Redondo, and Dale C. Macho, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 20, 1983, Ser. No. 534,041

Int. Cl.[4] B23B *51/00*

U.S. Cl. 408—93 **2 Claims**



1. An inverted cutter for performing a machining operation on a body having a relatively inaccessible work surface, comprising:

a cylindrical head having a lower surface and a planar upper surface, said head being capable of rotational movement in a counterclockwise direction about its longitudinal axis when said planar surface is proximate said work surface during said machining operation;

means for cutting said work surface when said head is being rotated in a counterclockwise direction whereby chips are produced, said cutting means comprising at least one cutting insert having selectable mounting faces, said insert being provided with a plurality of selectable cutting edges, one of said mounting faces and one of said edges being selected for use during said machining operation;

means forming at least one left-handed flute extending from said planar surface to at least said lower surface for conducting said chips away from said work surface during said machining operation, said flute means comprising a

first securing surface and a second securing surface for mounting said cutting insert, said first securing surface being offset with respect to said axis and being disposed at an angle which is skew to said axis to cause said selected cutting edge to be projected above said planar surface, said second securing surface intersecting said first securing surface at an acute angle;

means for releasably affixing said selected mounting face upon said first securing surface and for urging said insert towards said second securing surface;

a shank extending from said lower surface of said head, said shank having releasable means disposed at a position distal from said lower surface and capable of being coupled to a rotational drive source; and

a bore, coaxial with said axis, passing through said head and said shank to enable said shank releasable means to be coupled to said drive source whereby said shank may be driven in a counterclockwise direction during said machining operation.

4,621,958

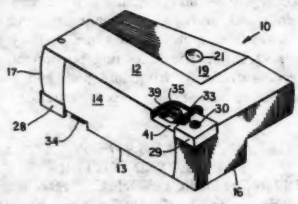
METAL BORING TOOL

Harry R. Ewing, R.D. 4 Box 31A, Titusville, Pa. 16354

Continuation of Ser. No. 314,708, Oct. 26, 1981, abandoned. This application Nov. 29, 1984, Ser. No. 676,452

Int. Cl.[4] B23B *29/03*

U.S. Cl. 408—232 **1 Claim**



1. In combination a boring bar **11** and a block **10**,

said boring bar **11** having a body comprising a first end portion having a first end having a flat planar end surface and a second end portion, a rectangular slot **26** extending through said end surface **60** into said bar dividing said first end portion of said bar into an first, upper lip and a second, lower lip,

said first, upper lip and said second, lower lip being integrally attached to said bar **11**,

said slot **26** being defined by a first planar surface, a second planar surface and a third planar surface **46'**,

said third planar surface **46'** defining the bottom of said slot **26**,

said first planar surfaces and said second surface being parallel to each other and disposed generally perpendicular to said third planar surface **46'** and to said end surface **60** and extending through the sides of said bar providing said slot **26** with an open front end, open sides and said second bottom,

a first threaded hole **25** extending through said first, upper lip from one side thereof to said slot **26**,

a second cylindrical hole extending through said second, lower lip,

said block **10** being made from a flat plate having a top **12**, a bottom **13**, a first side **16**, a second side **17**, a first end **14**, and a second end **15**,

a first flat inclined planar surface **19** extending from said second side **17** towards said first side **16** at an acute angle to said top **12** and a second inclined planar surface **20** extending from said first side **16** toward said second side **17** at an acute angle to said bottom **13** and disposed in a plane parallel to the plane of said first inclined surface **19**,

said block **10** having a thickness between said top **12** and said bottom **13** substantially greater than the width of said slot **26** between said parallel planar side surfaces defining said slot,

said inclined planar surfaces **19, 20** each terminating in rearwardly facing shoulders **50, 51**,

said flat inclined planar surfaces **19, 20** being spaced from each other a distance substantially equal to the width of said slot **26** in said bar,

said block **10** being received in said slot **26** in said bar with said inclined planar surfaces **19, 20** of said block engaging on said first and said second parallel planar surfaces defining said slot **26**,

a first recess and a second recess in said block,

each said recess having a flat bottom surface,

said bottom surfaces of said recesses being disposed in planes generally parallel to the plane of said inclined top and said bottom surfaces on said block,

said first recess in said block being disposed adjacent said first end **14**, said top **12** and said first side **16** and spaced from said second end **15**,

said first cutting insert **28** in said first recess resting on said flat bottom thereof,

said second recess being disposed adjacent said first end **14** and adjacent said second end **17** and said bottom **13** and spaced from said second end **15**,

a second cutting insert **29** is attached to said block **10** in said second recess resting on said flat bottom thereof,

said rearwardly facing shoulders **50, 51** of said block resting on said end surface **60** of said bar **11**,

and a tapered hole **21** in said block **10** extending from said first inclined surface **19** to said second inclined surface **20**,

a pin **31** having a threaded first end **23**, a tapered intermediate part **22** and a cylindrical second end **24**,

said pin **31** extending through said first threaded hole in said first, upper lip,

said tapered intermediate part **22** of said pin **31** being received in said tapered hole **21** in said block **10** and said cylindrical end **24** of said pin **31** being received in said cylindrical hole in said second, lower lip urging said shoulders **50, 51** into firm engagement with said end surfaces **60** of said bar **11** whereby said shoulders **50, 51** are placed in compression against said front end **60** of said bar **11**.

4,621,959

AREA CUTTING METHOD

Hajimu Kishi; Masaki Seki; Takashi Takegahara, and Yasushi Onishi, all of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

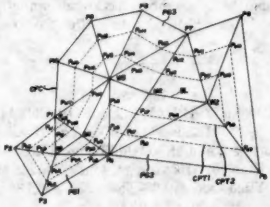
PCT No. PCT/JP84/00484, § 371 Date Jun. 10, 1985, § 102(e) Date Jun. 10, 1985, PCT Pub. No. WO85/01683, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 12, 1984, Ser. No. 744,746

Claims priority, application Japan, Oct. 22, 1983, 58-198040

Int. Cl.[4] B23C *3/20;* **G06F** *15/46*

U.S. Cl. 409—84 **15 Claims**



1. An area cutting method for cutting the interior of an area bounded by a curve of an external shape, comprising the steps of:

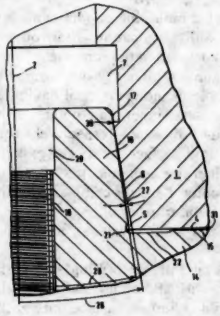
(a) dividing the bounded area into a plurality of convex polygons having boundary lines therebetween;
(b) calculating the centroid of each of the convex polygons and the mid-points of the boundary lines of two mutually adjacent convex polygons;
(c) partitioning, into a predetermined number of partitions for each of the convex polygons, line segments connecting the centroid of the convex polygon and the apices of the convex polygon, and partitioning, into a predetermined number of partitions for each of the mid-points, line segments connecting the mid-point and the two ends of the boundary line bisected by the mid-point; and
(d) moving a tool along plural closed paths obtained by connecting partitioning points corresponding to the line segments.

4,621,960

MULTIPLE-PART HOLDING ARRANGEMENT, IN PARTICULAR FOR CONCENTRICALLY ROTATING TOOLS

Klaus Töllner, Herrenberg-Kuppingen, Fed. Rep. of Germany, assignor to Montanwerke Walter GmbH, Tubingen, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,126
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314591
Int. Cl.⁴ B23B *31/08*
U.S. Cl. 409—232 **19 Claims**



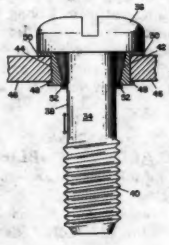
1. Multiple-part holding arrangement for a rotating body, particularly for a concentrically rotating tool, having
a receiver body element (1) formed with a coaxial receiving bore (5) having an inner cone surface (6);
a connection part element (14) having a coaxial centering stub (16) formed with an outer cone surface (17) fitting into the inner cone surface (6) of the receiving bore (5); and
a releasable holding device (11, 12) axially tightening the receiver body element and the connection part element together,
wherein,
the receiver body element (1) is formed with a receiver abutment face (4) extending at least approximately at right angle to the axis of rotation;
the connection part element (14) is formed with a connection abutment face (15, 15') extending at least approximately at right angle to the axis of rotation, said abutment faces being positioned in approximate axial alignment for mutual engagement;
the inner cone surface (6) of the receiving bore (5) has a cone angle (26) which is larger, by a predetermined small difference angle (27) than the cone angle of the outer cone surface (17) of the centering stub (16) for mutual engagement, upon introduction of the centering stub (16) into the receiving bore (5) of the outer cone surface (17) with the inner cone surface (6) initially in the vicinity of the smallest diameter (30) of the outer cone surface (17);
and wherein at least one of the elements (1, 14) is elastically deformable in radial direction to provide for elastic deformation of its respective cone surface engaging the matching cone surface of the other element upon axial tightening of the receiver body element (1) and the connection part element (14) axially towards each other by the releasable holding device (11, 12) until the abutment faces (4, 15, 15') mutually engage, and wherein the centering stub (16) is formed with a central coaxial bore (18, 20) to provide for radial elastic deformation of the connecting part element.

4,621,961

CAPTIVE PANEL FASTENER

Bulent Gulistan, 20568 Pinnacle Way, Malibu, Calif. 90265

Filed Feb. 28, 1985, Ser. No. 706,960
Int. Cl.⁴ F16B *21/10*
U.S. Cl. 411—352 **16 Claims**



1. A captive fastener assembly for fastening through a hole of a predetermined diameter in a panel, said assembly comprising:
a fastener having a head, a unthreaded cylindrical shank extending from said head, and fastening means on the outer end of said shank;
an expandable sleeve for mounting on said shank, said sleeve having an upper flange toward the head of the screw, and a lower flange having a diameter following expansion greater than said predetermined diameter, a generally cylindrical shank following expansion equal to or slightly less than said predetermined diameter, and said sleeve having a normal configuration in the undeformed initial state with the lower flange having a diameter substantially equal to or of a smaller diameter than said predetermined diameter; and
tapered means on said unthreaded shank adjacent the head of said screw for expanding the lower end of said sleeve starting from the same side of said panel as the head of said screw, said tapered means expanding said lower flange to engage said panel as said fastener assembly is pressed into the hole in said panel;
whereby said fastener with the tapered means and unstressed expandable sleeve mounted thereon may be slipped through the hole in the panel, and further pressure on the head of the screw expands the lower flange of said expandable sleeve to lock over the inner edge of said panel.

4,621,962

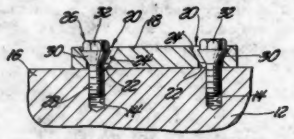
ADJUSTMENT STRUCTURE

Edward J. Rozniecki, 31041 Angeline Ct. W, St. Clair Shores, Mich. 48082

Filed Nov. 9, 1984, Ser. No. 669,911
Int. Cl.⁴ F16B *43/02*
U.S. Cl. 411—368 **4 Claims**

1. An adjustment mechanism for adjusting the relative positions of two or more parts comprising: a first movable member

having two cavities formed in its surface, the cavities being formed with a bore extending perpendicularly through the first member and an inverted frusto-conical portion formed at one end of the bore, the frusto-conical portion forming a camming surface; a second fixed base member mounted in contact with the surface of the first member containing the bores, the fixed member having two threaded apertures extending through the fixed member the distance between the longitudinal axes of the



threaded apertures being different from the distance between the longitudinal axes of the cavities; and two single piece threaded adjustment cams, the adjustment cams having a driving attachment at one end, a threaded portion and an angled cam portion, the threaded cams having the threaded portion disposed in the threaded apertures with the angled cam portion in contact with the cam surfaces of the frusto-conical portion so that advancing one of said cams and retracting the other cam will cause an axial movement in said first member.

4,621,963

FASTENER FOR ROOF ASSEMBLIES AND THE LIKE

Ernest W. Reinwall, McHenry, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Filed Mar. 26, 1984, Ser. No. 593,129

Int. Cl.[4] F16B *33/00*

U.S. Cl. 411—369 **2 Claims**

1. The combination of, a sheet of metal, a frame member, and a fastener for securing said sheet to said frame member in spaced relation to the latter, said combination being characterized in that said fastener comprises an elongated shank, a tip formed on one end of said shank, a driving head formed on the other end of said shank, said fastener projecting tip first through a hole of predetermined diameter in said sheet, said shank having a first portion extending from said tip toward said head and being of a diameter smaller than said predetermined diameter, a first thread formed on said first portion of said shank adjacent said tip and threaded into said frame member, said shank having a second portion beneath said head and having a third portion connecting said first and second portions, a plurality of elongated beads formed on and spaced angularly around said third portion and extending longitudinally of said shank, said beads being rounded at their sides and tapered longitudinally with their narrow ends adjacent said first portion and their wide ends adjacent said second portion, said second portion being larger in diameter than said first portion and said third portion being tapered to flare outwardly from said first portion to said second portion, and a second thread formed on said second portion, the root of said second thread being concavely radiused, the length of said first portion from the beginning of said first thread to said third portion being greater than the space between said sheet and said frame member whereby said third portion is drawn down through said hole as said first portion is threaded into the frame member and thereafter said second portion is threaded into the hole, the metal of said sheet being smoothly rolled over around said hole by said third portion and being received in the concavely radiused root of said second thread.

4,621,964

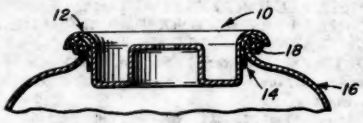
VALVE MOUNTING ASSEMBLY FOR AEROSOL CONTAINERS AND THE LIKE

Werner A. Radtke, Vernon Hills, and Joseph L. Roe, Des Plaines, both of Ill., assignors to Plastic Specialties and Technologies, Inc., Schiller Park, Ill.

Division of Ser. No. 395,434, Jul. 6, 1982. This application Dec. 3, 1984, Ser. No. 677,555

Int. Cl.[4] B21D *51/46*

U.S. Cl. 413—9 **6 Claims**



1. A method of assembling a valve mounting assembly including a sealing gasket and a mounting cup for aerosol containers and the like comprising

providing a valve mounting cup having a body defined by a cylindrical wall terminating in an outwardly circularly rolled annular surrounding channel,

providing an annular planar gasket formed of a self-sustaining deformable resinous material having a uniform thickness with coaxial inner and outer peripheries defining inner and outer diameters respectively, said gasket having top and bottom surfaces and said gasket inner diameter being less than the diameter of said cup cylindrical wall, said gasket outer diameter being greater than the diameter of said cup cylindrical wall,

coaxially aligning said gasket normal to and adjacent said cup body,

annularly and laterally deforming said gasket into forcible engagement with and about said cup body, and

curling said gasket bottom surface outwardly and circularly into intimate frictional engagement with said channel and said cup cylindrical wall.

4,621,965

MANIPULATORS

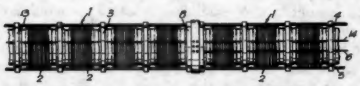
Peter D. Wilcock, Wantage, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 6, 1984, Ser. No. 576,940

Claims priority, application United Kingdom, Feb. 10, 1983, 8303694

Int. Cl.[4] B25J *1/02*

U.S. Cl. 414—7 **7 Claims**



1. A manipulator arm consisting of a plurality of annuli joined together by lengths of tubing having circumferential corrugations, two longitudinal webs extending the length of the manipulator arm and diametrically spaced with respect to the annuli, the webs being constructed to be flexible to bend in a first longitudinally extending plane but stiff against bending in a second longitudinally extending plane at right angles to the

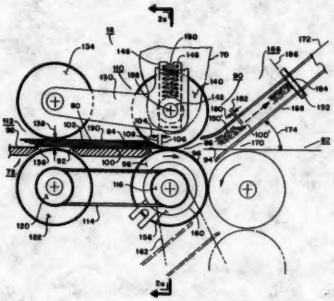
first plane and so positioned that the second planes of the webs are coincident thereby to render the manipulator arm flexible to bend in the first plane but stiff against bending the the second plane, and means for causing the manipulator arm to flex in the first plane.

4,621,966

SHINGLE COMPENSATING DEVICE

Harry E. Luperti, Bethel, and Anthony Luvara, Stamford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 2, 1984, Ser. No. 627,140
Int. Cl.[4] B65H *31/40*; B41F *13/54*
U.S. Cl. 414—43 **5 Claims**



1. A machine for accumulating and for stacking a plurality of documents in a first plane with the lead edge of the documents in a shingled relationship, and for feeding the accumulated stack of documents to a second plane disposed at an angle to the first plane with the lead edge of the documents in aligned relationship, said machine comprising;

A. a first pair of feed rollers,

B. means mounting said first pair of feed rollers so that one roller thereof is movable toward and away from the other and is biased toward the other in driving engagement therewith so as normally to define a nip between said pair of feed rollers, the bias being sufficiently yieldable to permit a stack of documents to pass between said feed rollers,

C. a second pair of feed rollers,

D. means mounting said second pair of feed rollers in spaced relationship with said first pair of feed rollers in an upstream direction therefrom, the feed rollers of said second pair of feed rollers being normally spaced apart to allow a plurality of documents to accumulate therebetween,

E. means for driving at least one roller of each of said first and second pairs of feed rollers,

F. support means lying in a predetermined plane on which the documents accumulate, said support means extending between said first and second pairs of feed rollers,

G. means for feeding documents along said support means seriatim and one on top of another to said nip of said first pair of feed rollers while the latter are stationary whereby the documents accumulate to form a stack with the lead edges of the documents disposed in a shingled relationship as determined by the arcuate contour of the periphery of one of said first pair of feed rollers,

H. actuating means responsive to input signals for causing said second pair of feed rollers to drivingly engage said stack, and for commencing rotation of said first and second pairs of feed rollers, and

I. guide means located on the downstream side of said first pair of feed rollers and lying in a plane disposed at an angle to said plane of said support means,

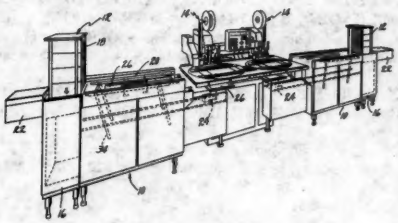
whereby, as the stack of documents traverses the arcuate contour of said one roller of said first pair of feed rollers in moving from said support means to the plane of said guide means, the documents of said stack shift with respect to one another so that the lead edge of the documents are in aligned relationship after said stack is moving along said guide means.

4,621,967

AUTOMATIC BOARD LOADERS

Daizo Masada, Urayasu, Japan, assignor to USM Corporation, Hartford, Conn.

Continuation of Ser. No. 340,474, Jan. 18, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,663
Int. Cl.[4] B65G *1/12*
U.S. Cl. 414—225 **11 Claims**



1. A machine for automatically loading and unloading printed circuit boards from an electrical component assembly machine having a component placing station comprising:

(a) a board loading mechanism for receiving the board from a board storage means and transferring the board onto the component placing station of the assembly machine;

(b) means for unloading an assembled board from the component placing station of the assembly machine;

(c) said unloading means including means for returning the assembled board back toward the storage means;

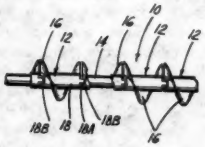
(d) said unloading means includes means for dropping the assembled board down through the placing station for returning the board back to the storage means.

4,621,968

SEGMENTED AUGER CONVEYOR

Marion E. Hutchison, Waterloo, Iowa, assignor to Tiger Industries, Inc., Waterloo, Iowa

Continuation-in-part of Ser. No. 567,899, Jan. 3, 1984, abandoned. This application Sep. 23, 1985, Ser. No. 778,891
Int. Cl.[4] B65G *65/46*
U.S. Cl. 414—311 **25 Claims**



1. Auger conveyor apparatus adapted to convey bulk material, said apparatus comprising reversible drive means, a plurality of axially aligned and connected segments which are adapted to be driven by said drive means, and coupling means between adjacent segments, said coupling means being adapted to transmit rotational motion from one said segment to a said adjacent segment, wherein said coupling means is further adapted to permit limited angular movement between said adjacent segments when the direction of drive rotation of said auger conveyor apparatus is reversed, wherein the total angular movement between a first said segment at one end of said apparatus and the last said segment at the opposite end of said

apparatus is at least 360°, and wherein said connected segments are self-supporting.

4,621,969

METHOD AND APPARATUS FOR LOADING AND UNLOADING A STORAGE AND TRANSPORT RACK

Christer K. Berghäll, Järvenpää; Jukka S. Ollikainen, Helsinki, and Timo T. Koskivaara, Järvenpää, all of Finland, assignors to Valpak Oy, Järvenpää, Finland

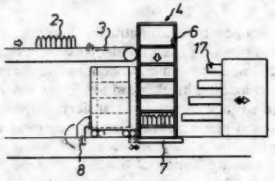
PCT No. PCT/FI83/00063, § 371 Date Jun. 7, 1984, § 102(e) Date Jun. 7, 1984, PCT Pub. No. WO84/01561, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 12, 1983, Ser. No. 619,153

Claims priority, application Finland, Oct. 12, 1982, 823467

Int. Cl.[4] B65G *1/00, 67/02*

U.S. Cl. 414—331 2 Claims



1. A method of loading a shelf-less storage and transport rack at predetermined station with several layers of goods, comprising the steps of: bringing in the goods in one layer on a conveyor, arranging next to said station an intermediate storage means having a plurality of horizontally movable plate-like members for supporting the layers respectively in said intermediate storage means, transferring said plate-like members and the goods thereon in vertical direction into a formation corresponding to the formation of goods in the rack, and pushing the plate-like members and the goods thereon from the intermediate storage means in one push into the shelf-less rack in staggered fashion so that the lowest layer is partially pushed into the rack first, and layers thereabove are pushed, staggered in succession, into a vertically aligned formation in the rack.

2. An apparatus for loading a storage and transport rack with several layers of goods, comprising: a conveyor for bringing in the goods in one layer, a shelf-less storage and transport rack for the goods, and rack being movable and lockable at a predetermined station for the loading of the goods, intermediate storage means arranged next to said station, and having horizontally movable plate-like members for supporting the respective layers of goods in said intermediate storage means, vertical transfer devices for transferring said plate-like members and the goods thereon in vertical direction into a formation corresponding to the formation of goods in the rack, and a multiple-layer pushing device arranged next to said intermediate storage means for pushing the goods from the intermediate storate means into said shelf-less rack, said pushing device comprising separate, vertically spaced pushers for the respective layers of goods, and means for moving said pushers in staggered fashion so that each pusher is moved in succession ahead of the pusher above the same but to the same extent, to thereby move the goods into a vertically aligned formation in the shelf-less rack.

4,621,970

APPARATUS FOR REMOVING REELS WITH EXPOSED ROLL FILMS FROM CARTRIDGES

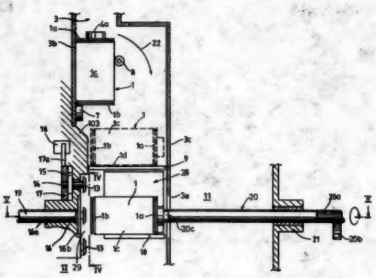
Reinhart Würfel, Munich; Helmut Zangenfeind, Puchheim; Günther Dömges, Deisenhofen, and Raimund Kugel, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 20, 1985, Ser. No. 778,609

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1984, 3437045

Int. Cl.[4] B65D *49/12*

U.S. Cl. 414—412 20 Claims



1. Apparatus for removing convoluted roll films from successive containers of the type having a substantially cylindrical shell with an axially parallel mouth, a pair of washer-like end walls engaging the ends of the shell and a film-supporting reel which is confined in the shell between the end walls and has a core with end portions which are accessible through the respective end walls, comprising means for positioning successive containers in a predetermined orientation at an opening station; holder means for externally gripping the shell at said station at a plurality of locations which are spaced apart from one another as considered in the circumferential direction of the shell; means for rotating the core of the reel in the container at said station including an axially movable mandrel which is in register with the core at said station and means for shifting the mandrel axially into torque-transmitting engagement with one end portion of the core at said station; and means for expelling the reel from the shell at said station, including a reciprocable pusher in register with the core at said station, the core at said station being located between said mandrel and said pusher, one end wall of the container at said station being adjacent to said mandrel and the other end wall of such container being adjacent to said pusher, and means for shifting said pusher toward and in the axial direction of said mandrel so that the pusher bears against the other end portion of the core and displaces the reel, the one end wall and the mandrel with reference to the shell at said station while the shell is gripped by said holder means.

4,621,971

MEANS FOR ROTATING TREE TRUNKS

Kauko Ratuio, 52700 Mäntyharju, Kolmihaarantie, Finland

Filed Apr. 23, 1985, Ser. No. 726,234

Claims priority, application Finland, May 3, 1984, 841768

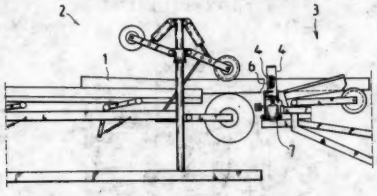
Int. Cl.[4] B65G *47/24*

U.S. Cl. 414—431 2 Claims

1. For use with conveyor apparatus including drive means for feeding a log to a processing station in a direction substantially parallel with the longitudinal axis of the log, a device for imparting rotational motion to a log about its longitudinal axis independently of the feeding motion of the log, comprising:

at least one pair of cylindrical rotators supported on opposite sides of said log for selective engagement with said log, said rotators having a longitudinal axis and external sur-

faces having helical upstanding portions, the longitudinal axes of said rotators being angularly disposed relative to said log longitudinal axis so that the upstanding portions on said rotator external surfaces do not impede the rate of feed of said log when said conveyor is operating, and



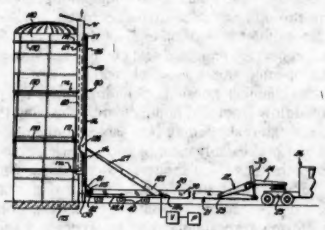
drive means, independent of said conveyor apparatus drive means, for driving said rotators in rotation about their longitudinal axes, whereby rotation of said log about its longitudinal axis is effected.

4,621,972

SILO MOVER

Walter D. Grotte, Box 72, Finley, N. Dak. 58230

Filed Feb. 19, 1985, Ser. No. 702,478
Int. Cl.[4] B60P *1/16*
U.S. Cl. 414—477 **16 Claims**



1. A machine for moving elongated cylindrical objects, such as farm silos, comprising:

a main frame having longitudinal main frame side members having a first length, and having front and rear ends and wheel means;

a subframe pivotally mounted on said main frame adjacent the rear end of the main frame, the subframe comprising a first subframe section having longitudinally extending first subframe side members which are pivotally connected to the rear ends, lie above and extend along the main frame side members, respectively, the first subframe side members each having an I-beam comprising a lower flange connected by a web to an upper flange and extending for substantially the entire length of the first subframe side members, and having first and second ends, and a second subframe section having second subframe side members slidably mounted on the upper flanges of the first subframe side members for slidably moving along the first subframe side members and being substantially the same length as the first subframe side members, and the second subframe being selectively moveable to positions extending beyond each of the first and second ends of the first subframe side members, the second subframe side members having substantially continuous outwardly facing surfaces, facing generally in direction away from the first subframe side members;

hydraulic cylinder means for raising and lowering said subframe about the pivotal mounting to the main frame from a first position wherein the first subframe side members are resting on the main frame side members to a second position wherein the subframe is substantially vertical, the upper flanges on the first subframe side member being substantially horizontal with the subframe in its first position and the lower flanges being offset from the pivotal mounting;

means to clamp a cylindrical object to be moved against the outwardly facing surfaces of said second subframe side members; and

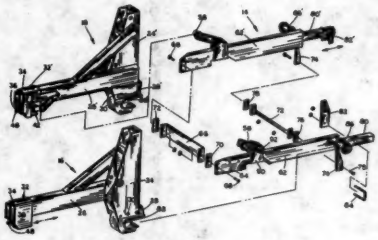
means for slidably moving said second subframe section relative to the first subframe section so that the first and second subframe side members are substantially in registry with each other to a position wherein an outer end of the second subframe section extends outwardly from the first end of the first subframe section in an upward direction when the subframe is substantially vertical, and to permit moving the second subframe section and a supported cylindrical object to position an end of the second subframe section side members opposite from the outer end to extend outwardly from the second ends of the first subframe side members with the subframe in its lowered position to thereby place a supported cylindrical object in position overlying the pivot between the main frame and the first subframe section and to move a base of the supported cylindrical object rearwardly relative to the main frame.

4,621,973

TRACTOR LOADER HAVING MULTI-ADJUSTMENT MOUNTINGS

Joseph W. Langenfeld, and Neal W. Westendorf, both of Onawa, Iowa, assignors to Westendorf Mfg. Co., Inc., Onawa, Iowa

Filed Sep. 6, 1985, Ser. No. 773,260
Int. Cl.[4] E02F *3/62*
U.S. Cl. 414—686 **9 Claims**



1. A loader device for a tractor, comprising,

a first and second mounting bracket means mounted at opposite sides of the tractor and having rearward and forward ends,

a first mounting pad means secured to said first mounting bracket means adjacent the forward end thereof,

a second mounting pad means secured to said second mounting bracket means adjacent the forward end thereof,

first and second roller brackets selectively removably secured to said first and second mounting pad means and extending upwardly therefrom,

first and second rollers mounted on the upper ends of said first and second roller brackets respectively and extending horizontally outwardly therefrom,

first and second mounting supports on said first and second mounting bracket means respectively and extending outwardly therefrom rearwardly of said roller brackets,

a tower assembly removably mounted on said first and second mounting bracket means,

said tower assembly comprising a generally U-shaped frame means including first and second side frame members having rearward and forward ends and a front frame

member secured to and extending between the forward ends of said side frame members; first and second towers secured to the rearward ends of said first and second side frame members respectively, each of said towers having an upper end positioned above the associated side frame member and a lower end positioned positioned below the associated side frame member,

a shoe assembly secured to the lower end of each of said towers and having a rearwardly presented opening which receives one of said mounting supports therein,

a slide block means selectively longitudinally adjustably mounted on each of said side frame members forwardly of said towers and having a rearwardly presented opening which receives one of said rollers therein,

means for selectively locking said tower assembly on said first and second mounting bracket means, and a pivotal boom means mounted on said towers.

4,621,974

AUTOMATED PIPE EQUIPMENT SYSTEM

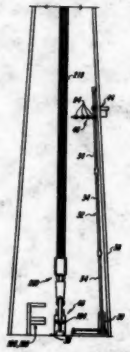
Roger J. Krueger, Arvada, Colo., assignor to InPro Technologies, Inc., Arvada, Colo.

PCT No. PCT/US83/01217, § 371 Date Oct. 6, 1983, § 102(e) Date Oct. 6, 1983, PCT Pub. No. WO84/00789, PCT Pub. Date Mar. 1, 1984

Continuation-in-part of Ser. No. 408,795, Aug. 17, 1982, Pat. No. 4,531,875. This PCT application Aug. 9, 1983, Ser. No. 537,684

Int. Cl.[4] E21B *19/14*

U.S. Cl. 414—786 **4 Claims**



1. A method for use in storing uncoupled pipes on a platform, comprising the steps of:

grasping one pipe to allow rotational movement thereof;

uncoupling the one pipe from adjacent pipe;

grasping the one pipe to prevent rotational movement thereof;

detecting that the one pipe is grasped before moving the pipe;

providing transport means that occupies substantially less space on the platform than that occupied by stored pipes;

moving the lower portion of the one pipe to said transport means;

releasing the lower portion of the one pipe to said transport means;

transporting the lower portion of the one pipe to its final storage position by moving said transport means over the platform before receiving a succeeding pipe; and

removing the lower portion of the one pipe from said transport means for storing the one pipe.

4,621,975

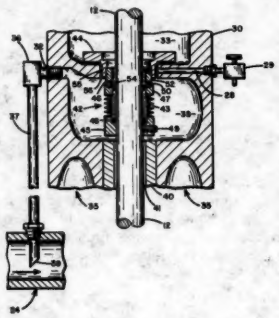
CENTRIFUGAL PUMP SEAL

James H. Larson, Andover, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Oct. 25, 1984, Ser. No. 664,528

Int. Cl.[4] F01D *11/00*

U.S. Cl. 415—111 **6 Claims**



1. An apparatus for liquid sealing a vertically aligned pump shaft projecting externally of a pump chamber housing, comprising

(a) a seal chamber formed adjacent and above said pump chamber, said seal chamber having an upper external opening through which said shaft projects and having a liquid flow outlet at least as high as the elevation of said external upper opening, said seal chamber having a lower external opening through which said shaft projects into said pump chamber housing, including means for permitting liquid flow from said pump chamber housing through said lower external opening into said seal chamber;

(b) a seal housing sealably closing said upper external opening except for the region about said shaft, said seal housing having a narrowed neck spaced about said shaft and downwardly projecting into said upper external opening; thereby forming an annular gap between said neck and said upper external opening;

(c) a bellows seal member sealably affixed to said shaft in said seal chamber and having an upwardly projecting shoulder in said seal chamber;

(d) a first sealing ring affixed to said downwardly projecting neck, and having a downwardly facing smooth seal face in said seal chamber;

(e) a second sealing ring seated in said upwardly projecting shoulder, and having an upwardly facing smooth seal face in said seal chamber and mated to said first sealing ring smooth seal face; whereby liquid in said seal chamber is in flow contact with said first and second sealing rings; and

(f) a bleed passage having a first opening into said annular gap and a second opening external of said pump chamber housing, and a bleed valve connected to said second opening.

4,621,976

INTEGRALLY CAST VANE AND SHROUD STATOR WITH DAMPER

Larry A. Marshall, Tequesta, and David A. Lewis, Stuart, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

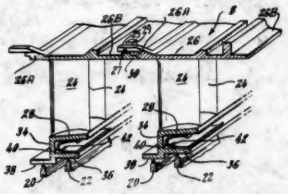
Filed Apr. 23, 1985, Ser. No. 726,260

Int. Cl.[4] F01D *9/04*

U.S. Cl. 415—191 **14 Claims**

1. An integrally cast stator for an axial flow gas turbine engine including an annular array of vanes integrally connected at their outer ends to an outer shroud and integrally connected at their inner ends to an inner shroud; said inner

shroud having a forward edge and a rearward edge; an inwardly extending radial flange integrally connected to the inner shroud; a cylindrical flange extending from the radial flange and extending under the inner shroud; said inner shroud, radial flange and cylindrical flange forming an annular C-shaped channel; an annular spring damping device having two



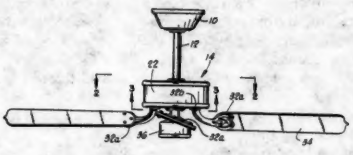
annular arms; said annular spring damping device being located in said annular C-shaped channel; said annular spring damping device having one annular arm fixed within said C-shaped channel; said annular spring damping device having said other annular arm biased against said inner shroud providing a preload on said inner shroud to obtain a desired frictional force level.

4,621,977

CEILING FAN

Michael A. Markwardt, Ft. Worth, Tex., assignor to Encon Industries, Inc., Fort Worth, Tex.

Filed Oct. 28, 1985, Ser. No. 791,750
Int. Cl.[4] F04D *25/08*
U.S. Cl. 416—5 **5 Claims**



1. A ceiling fan comprising:
a canopy positionable adjacent a ceiling surface;
a down rod projecting downwardly from said canopy;
a housing top plate defining an opening in the center thereof;
a first bearing disposed in said opening in said top plate and rotatably mounting said top plate to said down rod;
an iron armature detachably secured to said top plate;
a housing bottom plate defining an opening therein and detachably secured to said iron armature;
a second bearing disposed in said opening in said bottom plate and rotatably mounting said bottom plate to said down rod;
an annular housing side band disposed between said top plate and said bottom plate and radially outwardly of said iron armature; and
a stator plate assembly secured to said down rod at a location between said top plate and said bottom plate, said stator plate assembly including copper wire windings disposed opposite and in alignment with said iron armature.

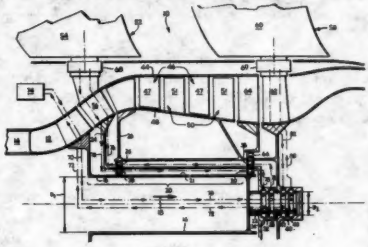
4,621,978

COUNTERROTATING POWER TURBINE

Alan R. Stuart, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 3, 1984, Ser. No. 677,631
Int. Cl.[4] F01C *1/26*
U.S. Cl. 416—127 **10 Claims**

1. An improvement for a gas turbine engine comprising:
a support having an annular axial cross-section and forward and aft portions, said forward portion having a diameter greater than the diameter of said aft portion;
a first rotor supported on said first portion by first bearing means and extending to said aft portion and forming a first interface therewith; and



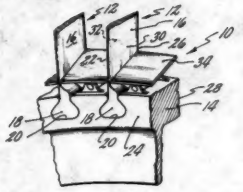
a second rotor supported on said first rotor by second bearing means and extending to said aft portion and forming a second interface therewith.

4,621,979

FAN ROTOR BLADES OF TURBOFAN ENGINES

Robert H. Zipps, East Hartford; Chester H. Rynaski, Meriden, and Graham B. Fulton, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 30, 1979, Ser. No. 99,058
Int. Cl.[4] F01D *5/30*
U.S. Cl. 416—219 R **4 Claims**



1. A fan blade of the type extending outwardly from a rotor disk across the annular flowpath for working medium gases in the fan section of a turbofan engine, including:
an airfoil section having an arcuate cross section contour at the inner wall of the working medium flowpath; and
a root section having an upstream end and a downstream end wherein
the root section is formed to an arcuate contour which approximates the arcuate contour of the airfoil cross section at the inner wall of the working medium flowpath projected onto the root section, and wherein
the root section is convergently tapered from the downstream end toward the upstream end of the blade.

4,621,980

FIBER REINFORCED COMPOSITE SPAR FOR A ROTARY WING AIRCRAFT

Richard T. Reavely, Madison, and David N. Schmaling, Oxford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 19, 1984, Ser. No. 652,029
Int. Cl.[4] B63H *1/20*
U.S. Cl. 416—226 **4 Claims**

1. A composite spar for a rotary wing aircraft blade comprising:
a plurality of layers of graphite and polyaramide fibers wherein the layers of graphite fibers are oriented at about ±30° to about ±40° and about ±12° to about ±16° to the

longitudinal axis of the structure and the polyaramide fibers are oriented at about ±12° to about ±16° to the

longitudinal axis and said matrix is a thermosetting resin, wherein the concentration of polyaramide fibers is greater than 25 percent by weight.

4,621,981

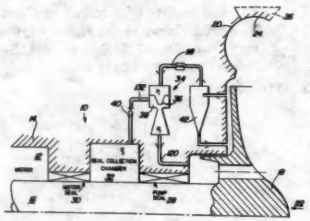
PUMP IMPROVEMENT

Jorge A. Lorett, Beaumaris, Australia, assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 438,550, Nov. 1, 1982, abandoned. This application May 3, 1985, Ser. No. 730,127

Int. Cl.⁴ F04D *7/06, 29/12*

U.S. Cl. 417—83 **4 Claims**



1. A pump assembly comprising:
a motor;
a housing for said motor;
a motor shaft extending from said motor and said housing;
a pump housing connected to said motor housing and having a pump inlet and a pump outlet;
an impeller arranged in said pump housing and connected to said shaft for pumping a liquid from said pump inlet to said pump outlet;
mechanical seal means surrounding said shaft and located between said pump housing and said motor housing to substantially prevent the ingress of pumped liquid into said motor housing, said mechanical seal means comprising a pair of mechanical seal assemblies each having a pair of seal rings with opposing seal faces and wherein one seal ring of each pair is rotatable relative to the other and means for resiliently urging one seal ring of each pair toward the other seal ring of said pair;
a seal leakage chamber surrounding said shaft and located between said seal assemblies and into which pumped liquid leaking across one of said pair of seal rings flows;
ejector means including a driving nozzle connected to said pump outlet such that said ejector means continuously operates as a function of pump operation; and
fluidic passageway connecting said ejector means to said seal leakage chamber and to said pump inlet in a manner whereby, upon pump operation, fluid from said seal leakage chamber is continuously evacuated to prevent the diffusion of liquid across said seal faces of the other of said seal assemblies and into said motor housing and is immediately returned to said pump inlet.

4,621,982

DOUBLE PUMP

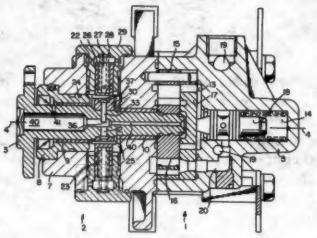
René Schulz, Neu-Anspach; Heinrich J. Braum, Bad Homburg; Kurt Nadolny, Erdmannhausen, and Van-Trung Nguyen, Stuttgart, all of Fed. Rep. of Germany, assignors to Vickers System GmbH, Bad Homburg and Daimler-Benz Aktiegesellschaft, Stuttgart, both of, Fed. Rep. of Germany

Continuation of Ser. No. 620,878, Jun. 15, 1984, abandoned. This application Nov. 12, 1985, Ser. No. 797,187

Claims priority, application European Pat. Off., Jun. 18, 1983, 83105969.6

Int. Cl.⁴ F04B *23/14;* **F16B** *7/18*

U.S. Cl. 417—201 **7 Claims**



1. A double pump including
a main pump,
a secondary pump,
a shaft for driving both the main pump and the secondary pump and defining a rotational axis,
cam ring means arranged to drive said secondary pump and having an inner surface coaxial to said rotational axis,
said shaft having an outer surface coaxial to said rotational axis and cooperating with said inner surface of said cam ring means,
a first bore extending transversely in said shaft in said outer surface,
a first retraction space provided in said shaft so as to register to said first bore,
a second bore extending transversely in said cam ring means in said inner surface,
a second retraction space provided in said cam ring means so as to register to said second bore,
said first and second bores being aligned to one another and safety shear means inserted in said first and second bores and mounting said cam ring means on said shaft,
at least one of said first and second retraction spaces, in the event of fracture of said shear means, provide a space wherein a fractured piece of said shear means can partially withdraw.

4,621,983

VARIABLE CAPACITY WOBBLE PLATE COMPRESSOR WITH IMPROVED MEANS FOR RETURNING LUBRICATING OIL TO CRANKCASE

David L. Thomas, Columbus, Ohio, and Nobuhiko Suzuki, Konan, Japan, assignors to Diesel Kiki Co., Ltd., Japan

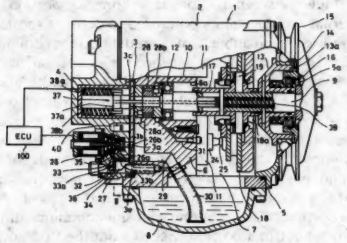
Filed Apr. 12, 1985, Ser. No. 722,797

Int. Cl.⁴ F04B *1/28*

U.S. Cl. 417—222 **8 Claims**

1. In a variable capacity wobble plate compressor including a high pressure chamber disposed to be supplied with discharge fluid with lubricating oil entrained therein, a crankcase having a bottom portion formed with an oil sump, a communication passageway communicating said high pressure chamber with said crankcase, a pressure regulating valve disposed across said communication passageway for selectively closing and opening same, said pressure regulating valve having an inlet port, and control means for controlling said pressure regulating valve to selectively close and open said communica-

tion passageway, whereby the pressure within said crankcase is controlled through selective closing and opening of said pressure regulating valve, to vary the capacity of said compressor, the improvement comprising oil guide passage means forming a portion of said communication passageway extending between a lower portion of said high pressure chamber and said



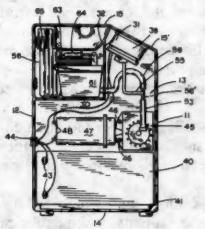
inlet port of said pressure regulating valve, for guiding lubricating oil therethrough, whereby when said pressure regulating valve is open, lubricating oil which has collected in said high pressure chamber flows through said oil guide passage means, said open pressure regulating valve, and part of said communication passageway.

4,621,984

PORTABLE AIR PUMP

David A. Fussell, Lawrenceville, Ga., assignor to Air Shot, Inc., Norcross, Ga.

Filed Apr. 17, 1985, Ser. No. 724,293
Int. Cl.[4] F04B *35/04*
U.S. Cl. 417—234 **2 Claims**



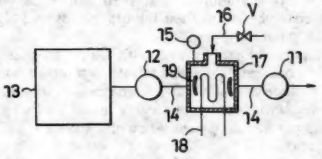
1. A portable air pump comprising a housing that has a bottom wall fixedly conjoined by side walls to a top wall which has an opening formed therein from which a cup-shaped wall extends reentrantly downwardly to provide a hand grip; an internal wall at least partially located between said housing bottom wall and said cup-shaped wall that partitions first and second internal compartments within said housing; a battery mounted within said first compartment adjacent said bottom wall and electrically coupled with a jack mounted on said housing; an air compressor mounted within said first compartment above said battery and electrically coupled with said battery through switch means mounted on said housing accessible to ambience; vent means for permitting air ingress from ambience into said first compartment; a battery recharger stowable within said second compartment that has flexible electrical wiring which terminates with a plug adapted for releasable connection with said jack; an air hose extending from said air compressor within said first compartment into said second compartment that has a limber hose portion of a size stowable in a compacted configuration within said second compartment along with said battery recharger; and door means for providing access from ambience into the interior of said second compartment for extending the air hose to and from ambience and for removing and stowing the recharger.

4,621,985

HIGH VACUUM APPARATUS

Masao Kobayashi; Nobuyuki Ishida, and Yoshihiro Toyoda, all of Neyagawa, Japan, assignors to Honjo Chemical Kabushiki Kaisha, Osaka, Japan

Filed Jul. 16, 1984, Ser. No. 631,107
Claims priority, application Japan, May 30, 1984, 59-111721
Int. Cl.[4] F04B *25/00*
U.S. Cl. 417—250 **5 Claims**



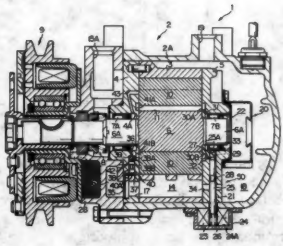
1. A high vacuum apparatus which comprises:
a vacuum vessel,
a mechanical booster pump which uses no vacuum pump oil connected to the vacuum vessel,
an oil rotary pump connected to the mechanical booster to produce a vacuum in a connecting pipe which connects the mechanical booster to the oil rotary pump, and
a gas inlet provided in the connecting pipe to introduce a gas into the suction side of the oil rotary pump so as to maintain the degree of vacuum in the suction side of the rotary pump sufficiently lower than the maximum degree of vacuum attainable by the rotary pump so as to substantially prevent reversible oil vapor diffusion, thereby attaining a high vacuum with substantially no oil contamination in the vacuum vessel.

4,621,986

ROTARY-VANE COMPRESSOR

Yukio Sudo, Atsugi, Japan, assignor to Atsugi Motor Parts Company, Limited, Japan

Filed Dec. 4, 1985, Ser. No. 804,399
Int. Cl.[4] F04B *49/02*
U.S. Cl. 417—304 **6 Claims**



1. A rotary-vane compressor comprising:
a main housing formed with a high-pressure chamber;
a front-housing plate secured to said main housing and formed with a low-pressure chamber; and
compression means arranged within said main housing;
said compression means comprising a pump housing comprising a cam ring formed with a substantially eliptical cam surface and first and second ring plates mounted on

said cam ring to close said cam ring, a rotor rotatably supported within said cam ring and formed with a plurality of substantially radially extending slots and a plurality of back-pressure passages each held in fluid communication with an radially inward end of the corresponding slot, and a plurality of vanes each received slidably in the corresponding slot, lubricating oil in said high-pressure chamber being conducted to said back-pressure passages;

said cam surface of said cam ring and an outer peripheral surface of said rotor forming a pump chamber;

said cam ring being formed with first and second intake ports which respectively communicate at their one ends with said low-pressure chamber and at their the other ends with said pump chamber and a pair of discharge ports which respectively communicate at their one ends with said pump chamber and at their the other ends said high-pressure chamber, wherein

said pump housing is formed with a first by-pass passage which is open at its one end to said first intake port and at its the other end with said high-pressure chamber, and provided with first by-pass valve means so that said first by-pass passage is opened when an external signal is supplied, and

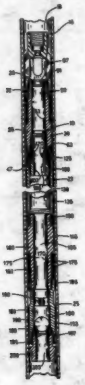
said first ring plate is provided with an one-way flow check valve to block fluid communication between said first intake port and said low-pressure chamber only when said first by-pass passage is opened.

4,621,987

PLUNGER APPARATUS

Benjamin F. Spingath, Jr., Bakersfield, Calif., assignor to William Swaim, Bakersfield, Calif., a part interest

Filed Mar. 7, 1985, Ser. No. 709,314
Int. Cl.[4] F04B *39/16, 21/04*
U.S. Cl. 417—313 **2 Claims**



1. A plunger for pumping fluids against gravity within a well or the like of the type having an elongated tubular barrel providing a substantially cylindrical interior surface of predetermined diameter bounding a bore, the apparatus comprising:

a. a predetermined upper portion having a mandril member providing a substantially cylindrical external surface having a diameter less than that of the interior surface of the barrel to permit the mandril member operatively to be substantially loosely received within the bore of the barrel for reciprocal movement axially thereof and to define an interface between the external surface and the interior surface of the barrel, the mandril member further providing an internal surface bounding a primary bore of predetermined dimensions communicating therethrough for the flow of fluids between the mandril member and the bore of the barrel upon reciprocal movement thereof, and providing a discharge passage communicating between the external surface and the internal surface; and a second member removably secured on the mandril member for movement therewith providing an external surface and an internal surface bounding a primary bore communicating with the primary bore of the mandril member for the flow of fluids between the primary bores, a portion of the external surface being configured to define a substantially cylindrical chamber of predetermined dimensions bounded partially by a portion of the internal surface of the mandril member communicating with the discharge passage, the second member providing at least one inlet slot disposed in fluid-flow communicating relation between the internal surface thereof and the chamber, the chamber providing a predetermined first portion and a second portion spaced from the first portion, said discharge passage communicating with the chamber in the first portion and at least one inlet slot communicating with the chamber in a portion spaced from the first portion;

b. a porous filter element removably captured in the chamber to restrain the movement of particulate material carried by fluid moving through the chamber;

c. an elongated intermediate portion secured in fluid-tight relation on the upper portion for movement therewith and having an external surface dimensioned for loose-fitting movement within the barrel in spaced relation to the interior surface thereof to define an interface therebetween communicating with the interface defined between the mandril member and the interior surface, the intermediate portion further providing an internal surface bounding a primary bore disposed in fluid-flow relation to the primary bore of the second member;

d. a lower portion secured on the intermediate portion for movement therewith and having an external surface dimensioned for loose-fitting movement within the barrel in spaced relation to the interior surface thereof to define an interface therebetween communicating with the interface defined between the intermediate portion and the interior surface, and an internal surface bounding a primary bore disposed in fluid-flow relation to the primary bore of the intermediate portion;

e. a valve mounted on the lower portion to restrict the flow of fluid by gravity through the primary bore thereof;

f. at least one sealing member mounted on the upper portion in slidable, substantially sealing relation to the interface between the mandril member and the interior surface of the barrel; and

g. at least one sealing member mounted on the lower portion in slidable, substantially sealing relation to the interface between the lower portion and the interior surface of the barrel.

4,621,988

LIQUID INTENSIFIER UNIT

Robert W. Decker, Stewartsville, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 16, 1985, Ser. No. 776,463
Int. Cl.[4] F04B *35/02*
U.S. Cl. 417—342 **14 Claims**

1. A liquid intensifier unit, comprising:

a plurality of separately-housed and self-contained liquid intensifiers; and

means fastening said intensifiers together in juxtaposition; wherein

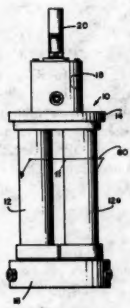
each of said intensifiers has a first, common means for both admitting thereinto, and discharging therefrom, respectively, an operating, low-pressure fluid;

each of said intensifiers further has a second, common means for both admitting thereinto, and discharging therefrom, respectively, a subject liquid for pressure intensification of such liquid by such each intensifier;

each of said intensifiers also has a given, variable volume chamber formed therewithin for receiving therewithin, and expelling therefrom, an operating liquid; and further including

third means effecting an open, fluid communication of each of said given, variable-volume chambers with each of the others thereof for conducting operating liquid, expelled from a given chamber of one of said intensifiers, to said given chamber of another of said intensifiers; and

valving means, coupled to said intensifiers for admitting an operating, low-pressure fluid to said first, fluid-admitting



means of each of said intensifiers, in turn, and repetitively; wherein

said valving means comprises a rotary valve;

said valve having a housing with a cylindrical bore formed therein; and

a rotor-type valving element rotatably journaled, on an axis, in said bore; wherein

said element has a pair of spaced-apart radial lands which sealingly engage the inner surface of said bore;

said lands extend circumferentially through approximately two hundred and twenty degrees of arc.

4,621,989

SUPPORT DISC FOR PUMP DIAPHRAGM

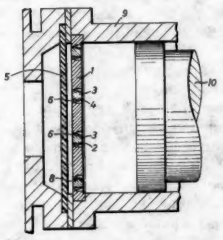
Herwig Burgert, 40, Bismarckstrasse, 6300 Giessen, Fed. Rep. of Germany

Filed Jul. 15, 1980, Ser. No. 169,044

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1979, 2930765

Int. Cl.⁴ F04B *43/06*

U.S. Cl. 417—383 **1 Claim**



1. A support disc for supporting the flexible diaphragm of a liquid-handling pump, said disc having holes extending therethrough, wherein the improvement comprises:

plugs secured in said holes, said plugs having a shape defining an opening between the outer plug surface and the surrounding hole in the disc wall, said opening being sufficiently wide to allow liquid from said pump to pass therethrough and being sufficiently narrow to prevent said diaphragm from being drawn into said pump; and

(a) said holes having a diameter stepped so that the holes have a larger diameter on the side facing the diaphragm;

(b) said plugs have an accordingly stepped diameter to fit in said holes, the large plug diameter being smaller than the large diameter of the holes so that an open ring exists between the disc wall and the outer plug surface;

(c) second holes drilled half into the disc material and half into the plug material from the side of the smaller hole diameter, the second holes being drilled down to a level of the diameter step; and

(d) a groove in the outer cylinder surface of the plugs at the level of the end of the second holes;

the open ring and the groove and the second holes forming together the opening which allows liquid of said pump to pulsate freely through the disc and which at the same time prevents said diaphragm from being drawn into said pump.

4,621,990

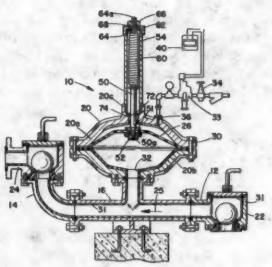
DIAPHRAGM PUMP

Carl Forsythe, Tulsa; Jon L. Dorminy, Sand Springs, and Joseph W. Raymon, Skiatooth, all of Okla., assignors to The Gorman-Rupp Company, Mansfield, Ohio

Filed Mar. 1, 1985, Ser. No. 707,460

Int. Cl.⁴ F04B *43/06*

U.S. Cl. 417—395 **6 Claims**



1. In a spring assist, air operated diaphragm pump including a pump housing having an inlet and an outlet, a diaphragm mounted in said pump housing for movement through a power stroke and a return stroke as pressurized air is cycled into and out of said housing, the improvement comprising a spring tube connected to said housing, a tension rod connected to said diaphragm and projecting into said tube, and a spring interposed between said rod and said housing, whereby said spring is tensioned during the power stroke of said diaphragm and serves to assist movement of said diaphragm during its return stroke and further wherein said spring is free of loading stress when said diaphragm is at the end of its return stroke.

4,621,991

QUIET BY-PASS VACUUM MOTOR

Francis E. Smith, Chagrin Falls; Robert L. Hyatt, Tallmadge, and Leonard J. Kline, Jr., Ravenna, all of Ohio, assignors to Ametek, Inc., Kent, Ohio

Filed Feb. 22, 1985, Ser. No. 704,321

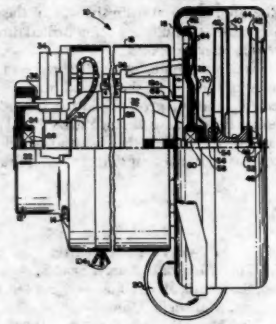
Int. Cl.⁴ F04B *17/00*

U.S. Cl. 417—423 A **19 Claims**

1. In a vacuum motor assembly comprising a commutator end bracket housing a commutator, a fan end bracket housing a working air fan assembly, a band interconnecting the brackets and maintaining field coils and an armature therein, the commutator being received on a first end of a motor shaft and the working air fan assembly received on a second end thereof,

the shaft passing through the coils and armature, the improvement, comprising:

a motor cooling fan maintained upon the shaft and between the working air fan assembly and the field coils and armature, said motor cooling fan being received and rotational within an opening in a bottom portion of the band, said bottom portion of tbe band being maintained in spaced relation to a top portion of the fan end bracket, said top



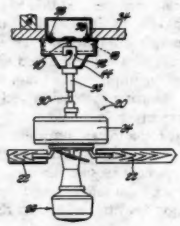
portion of the fan end bracket comprising a substantially flat plate in the area below said motor cooling fan, said flat plate receiving air passing axially through said motor cooling fan and radially redirecting said air between said bottom portion of the band and said top portion of the fan end bracket, and wherein said bottom portion of the band tracks said top portion of the fan end bracket, defining a passage of substantially uniform dimensions.

4,621,992

REMOTELY CONTROLLED CEILING FAN AND LIGHT ASSEMBLY

Paul G. Angott, Troy, Mich., assignor to Clifford G. Dimmitt, Troy, Mich.

Filed Apr. 26, 1984, Ser. No. 604,219
Int. Cl.[4] F04B *21/00*
U.S. Cl. 417—572 **3 Claims**



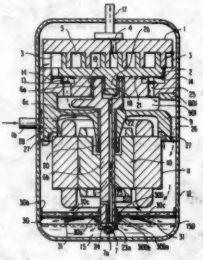
1. A fan assembly (20) for being mounted to a ceiling and suspended therefrom and comprising; support means adapted for connection to a ceiling and an electrical power outlet, a fan blade means (22) rotatably supported by said support means, an electrical drive motor (24) supported by said support means for rotating said fan blade means (22), an electrical light means (26) supported by said support means for selectively providing illumination, said assembly characterized by radio signal receiver means (48) electrically connected respectively to said drive motor (24) and said light means (26) and adapted for electrical connection to the electrical power outlet for controlling the electrical power supply to said drive motor (24) and said light means (26) independently of one another in response to predetermined first and second radio signals, said receiver means including electrical current regulator means (60,61,62,63) for establishing the magnitude of electrical power supplied to said drive motor (24) and said light means (26) respectively over a predetermined range of power in response to said first and second radio signals respectively to establish the speed of rotation of said drive motor (24) for said fan blade means (22) in response to the employment of said first radio signal and to turn said light means (26) ON and OFF and establish the degree of illumination of said light means (26) among a plurality of different degrees of illumination over said predetermined range of power in response to the employment of said second radio signal.

4,621,993

SCROLL-TYPE POSITIVE FLUID DISPLACEMENT APPARATUS WITH OIL COMPARTMENT PLATE

Toshiyuki Nakamura; Masahiro Sugihara; Tsutomu Inaba, and Tadashi Kimura, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,227
Claims priority, application Japan, Feb. 10, 1984, 59-23280
Int. Cl.[4] F01C *1/04, 21/04;* **F01M** *1/02, 11/00*
U.S. Cl. 418—55 **4 Claims**



1. A scroll-type positive fluid displacement apparatus comprising:

(a) a stationary scroll member (1) having a first spiral-shaped wrap,

(b) an orbiting scroll member (2) having a second spiral-shaped wrap of the same shape as that of said first spiral wrap, said first and second wraps having rotated relative orientation,

(c) a compression pocket (5) formed by a space between the wraps of said stationary scroll member and said orbiting scroll member,

(d) a substantially vertically aligned drive shaft (6) having an eccentric hole formed at its upper end with a predetermined eccentricity, causing said orbiting scroll member to orbit,

(e) a bearing (18) mounted in said hole for radially supporting said drive shaft,

(f) a supporting member (8) (9) supporting said bearing,

(g) a motor rotating said drive shaft,

(h) a shell, a bottom portion of which is a basin (150), to pool an oil in which a lower end of said drive shaft is dipped, said shell containing said stationary and orbiting scroll members in its upper side and said motor in its lower side,

(i) pumping means having a hole opening at said lower end of said drive shaft, said pumping means formed at least partially in the axial direction within said drive shaft and communicating to said bearing, to pump up the oil in said basin to said bearing by the rotation of said drive shaft,

(j) a compartment plate (3) above said basin and below said motor having a center hole (300) to receive a lower end portion of said drive shaft below said motor therethrough at its center, said center hole providing a gap between said compartment plate and said drive shaft, said compartment

plate collecting said oil in a pool at an upper face of said compartment plate, said gap allowing oil to flow from an upper side of said compartment plate to said basin, and

(k) flow preventing means operatively associated with said plate for allowing flow of said oil in the direction from an upper side to a lower side of said plate and for inhibiting flow of said oil from said lower side to said upper side of said plate.

4,621,994

LOBE ROTOR PUMPS

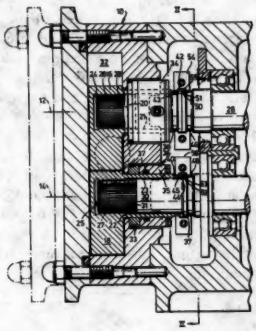
George W. Ellis, Downley, England, assignor to SSP Pumps Limited, Sussex, England

Filed Dec. 20, 1984, Ser. No. 684,135

Claims priority, application United Kingdom, Dec. 20, 1983, 8333929

Int. Cl.[4] F04C *18/02*

U.S. Cl. 418—206 **3 Claims**



1. A lobe rotor pump for use in an non-contamination environment, comprising, in combination:

(a) a metal casing;

(b) a pair of interengaging lobe metal rotors mounted for contrarotation about parallel axes within said casing;

(c) an integral cylindrical sleeve formed on each rotor so as to be coaxial therewith, each said sleeve having an outer cylindrical surface, an end adjoining the rotor and a free end remote therefrom;

(d) a blind bore extending through each sleeve towards the rotor integral therewith, said blind bore being open at the feed end of the sleeve and closed at its other end;

(e) a seal arrangement mounted within the casing and in sealing contact with the outer cylindrical surface of each sleeve, a part of each sleeve extending axially beyond its associated seal arrangement on the side thereof remote from its rotor;

(f) a pair of drive shafts each having an end portion extending into one of said blind bores;

(g) splines formed on an end portion of each drive shaft and complementary splines formed within the portion of said bores formed within said rotors themselves; and

(h) separate retaining means engaging the exterior surface of each of said sleeve parts and an adjacent part of its drive shaft effective to retain each sleeve and its drive shaft in axial engagement, each retaining means being located wholly on the side of the associated seal arrangement remote from its rotor said means being the sole means to retain said rotor on said drive shaft.

4,621,995

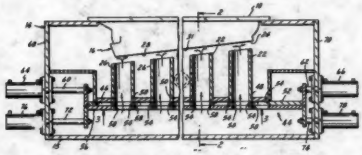
MULTIPLE ZONE HEATING OF MOLDS

John M. Wersosky, Dover, N.H., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Oct. 18, 1985, Ser. No. 789,197

Int. Cl.[4] B29C *41/18, 41/46*

U.S. Cl. 425—144 **5 Claims**



1. An assembly for molding an article of heat-fusing plastisol material comprising; a mold having a mold surface and a backside surface, a plenum plate having openings therein, first and second sets of nozzles, each nozzle having an inlet end received in one of said openings, said first set of nozzles having jet outlets disposed adjacent the mold backside surface to direct a heating or cooling gas from said first set of nozzles to produce short flow paths of said gas flow across said backside surface over a first area thereof for controlling the temperature over said first area of the mold backside surface, said second set of nozzles having jet outlets disposed adjacent the mold backside surface over a second area thereof for producing short flow paths of a heating or cooling gas thereacross for controlling the temperature over said second area of the mold backside surface, and slide valve means including first and second thin plates having openings therein, said plates being slidable relative to each other and said plenum plate such that said openings may be selectively aligned with said nozzle inlet ends for controlling flow of said gas through said first and second sets of nozzles in a first operative position for maintaining the temperature of one of said first and second areas at a non-gelling temperature below that required to gel any appreciable thickness of the heat-fusing material and for heating another of the areas of said mold surface to a higher temperature than said first area for gelling material on a portion of the mold surface, said plates having a second operative position maintained during both fusion and cooling phases of operation wherein either heated gas or cooling gas is directed through all nozzles in both of said sets of nozzles whereby all areas of the mold are heated to a like fusion temperature or to an even cooling temperature for removal of fused parts from the mold.

4,621,996

REMOVABLE DIE CENTER FOR EXTRUSION DIES

Raymond E. Hundley, III, Eagle Rock, Va., assignor to Gala Industries, Inc., Winfield, W. Va.

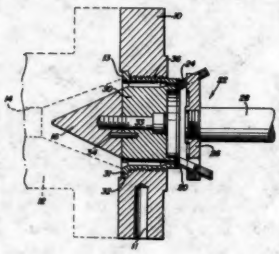
Filed Apr. 24, 1985, Ser. No. 727,242

Int. Cl.[4] B29C *47/30, 47/86*

U.S. Cl. 425—190 **3 Claims**

1. An extrusion die plate for a plastic pelletizing machine comprising a die plate having peripherally located means for receiving heating cartridges for heating the die plate and adapted to be mounted on a housing, said die plate including a large central opening terminating inwardly of the cartridge receiving means and extending from the upstream side to the downstream side, a die plate insert in said opening with the insert including orifice means therein extending from the upstream side of the insert to the downstream side thereof, said insert having a thickness substantially the same as the die plate with the downstream side of the insert having a wear surface projecting beyond the downstream side of the die plate with the orifice means extending through the wear surface, said wear surface adapted to be engaged by the blades on a rotatable knife assembly to form pellets from plastic material extruded through the orifice means, and means removably secur-

ing the insert in the opening to enable quick removal for cleaning and quick replacement for insertion of an insert having a different number of or size of orifice means therein, said securing means including means to position the insert axially at a



predetermined relation to the die plate in order to reposition the wear surface in exactly the same position when inserts of the same length are changed to maintain a constant relation between the wear surface and the blades on the knife assembly.

4,621,997

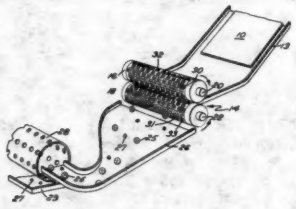
WAFER DIE CONSTRUCTION

John F. Cavanagh, Jr., Matunuck, and Paul A. Cavanagh, No. Scituate, both of R.I., assignors to Cavanagh & Sons, Inc., Greenville, R.I.

Filed Sep. 23, 1985, Ser. No. 778,781

Int. Cl.[4] A21C *5/00, 11/04, 11/08, 11/10*

U.S. Cl. 425—299 **3 Claims**



1. In an apparatus for manufacturing wafers having rotatable forming rolls opposing each other, each forming roll defining at least one cavity below the surface of the roll, said at least one cavity having an outer edge wall extending from the bottom portion of the cavity at an obtuse angle, forming tapered edges surrounding each said cavity, each said cavity in a first of said rolls being aligned such as to form a cooperating die pair with one said cavity of a second of said rolls, means for guiding a sheet of bread between said rolls, means for rotating said rolls in unison, said rolls pressing a sheet of bread between each said die pair to form a wafer from the sheet of bread, said tapered edges cutting the wafer from said sheet of bread, each of said rolls defining means within each said cavity to impress into the bread substantially equally from both sides to proclude warping of the bread.

4,621,998

PRESS FOR CONTINUOUSLY PRODUCING BAND-LIKE ARTICLES

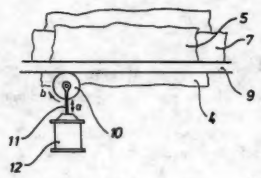
Josef Köhler, Northeim, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,704

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1984, 3428936

Int. Cl.[4] B30B *5/06;* **B29D** *7/14;* **B29J** *5/00*

U.S. Cl. 425—329 **4 Claims**



1. A press for continuously producing a band-like article, said press including circulating, endless molding or curing bands which sandwich the article between them, and which can be adjusted relative to one another via the pressure effect of roller bodies; said press also includes flexible enclosing strips which are disposed on both sides of said article, are in direct contact with the side edges of the latter, and move along with said article; the improvement comprises:

pressure members disposed in the entry region of said press between said molding or curing bands and in contact with the outer surfaces of said enclosing strips; under the effect of force, and at right angles to the direction of travel of said article through said press, means for causing said pressure members to be pressed from the outside against those outer side surfaces of said enclosing strips remote from said article.

4,621,999

BELT-TYPE PRESS FOR MAKING PARTICLEBOARD, FIBERBOARD, AND LIKE PRESSEDBOARD PRODUCTS

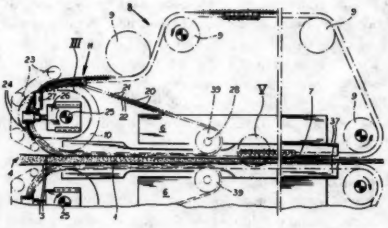
Klaus Gerhardt, Rheurdt, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Aug. 21, 1985, Ser. No. 768,026

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432549

Int. Cl.[4] B30B *5/06;* **B29D** *7/14;* **A23G** *1/20*

U.S. Cl. 425—371 **7 Claims**



1. In a belt-type press for making fiberboard, particleboard, and the like pressedboard products comprising an endless upper press belt circulated over at least one upper belt guide roller, a corresponding endless lower press belt circulated over at least one lower belt guide roller, said upper and lower press belts forming a pressing gap in a pressing region, and a press framework having lower and upper platens as well as a drive

mechanism, whereby in said pressing region between each of said upper and lower platens and the corresponding one of said upper and lower press belts a rod container is positioned from which a plurality of rolling rods are fed with spacing from each other, and are guided by one of an upper and lower rod circulating mechanism, wherein said upper and lower rod circulating mechanisms each comprise two first chains each guided over at least one sprocket and at least one first chain drive wheel, a pluarlity of interlinked chain link members having a plurality of chain bolts, a plurality of running rollers mounted on said chain bolts, and at least one guide rail for said running rollers, said rolling rods being attached between said two first chains with equalizing free play, at least one end of each of said rolling rods having a recess bored therein, in which one of a plurality of support bolts attached to one of said first chains engages so as to provide said equalizing free play, and wherein in an entrance region of said pressing gap and of said upper and lower platens an upper and lower second chain each having a plurality of chain rollers in a triangular configuration, each of said second chains being guided over at least one second chain guide wheel, are positioned, said rolling rods between said first chains being guided on said chain rollers similar to roller bearings, the improvement wherein said first chains and said second chains in said entrance region form an entrance V-shaped region symmetrical with respect to a horizontal center plane, in which said press belts press said rolling rods on said chain rollers of said second chains constructed with said equalizing free play, said second chains operating as aligning chains for said input of said rolling rods perpendicular to the circulating direction of said rolling rods wherein said sprockets and at least two of said second chain guide wheels are mounted on a guide wheel shaft, which is driven rotatably, and said guide wheel shaft is mounted at least at a first end in a sliding carriage, which by an adjusting motor is shiftable in a horizontal direction.

4,622,000

APPARATUS FOR PRODUCING PROPELLANT CHARGE POWDER IN THE FORM OF STRANDS

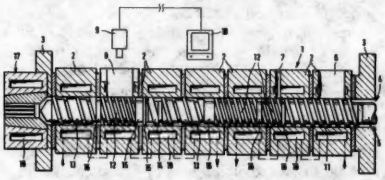
Dietmar Müller, Karlsruhe; Rudolf Kröhnert, Ettlingen, and Harald Franken, Karlsruhe, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e., Fed. Rep. of Germany

Filed Feb. 26, 1985, Ser. No. 705,689

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 34072381

Int. Cl.[4] A23G *3/00*

U.S. Cl. 425—467 **7 Claims**



1. Apparatus for producing propellant charge powder in strand form and comprising in combination:

housing means defining an elongated chamber and having openings to receive the solid and liquid components to be mixed,

screw means rotatably provided in the chamber and said screw means having helical flutes for mixing these components and feeding the mixture in a downstream direction around the central axis of the elongated chamber,

a mold head at the downstream end of said casing and having a central bore defining a downstream end of said elongated chamber,

said screw means having a downstream end in said mold head central bore,

a perforated plate defining the downstream end of said central bore and having a plurality of circumaxially spaced openings (21, 21) therethrough,

a molding chamber defined in said mold head downstream of said plate and communicating with said circumaxially spaced plate openings, said chamber having a central axis and defining the final cross sectional shape of the strand being formed,

passageway means (27, 26 and 25) defined by the mold head and by said perforated plate but not in communication with said central bore or said plate openings,

said plate having a central portion between said plate openings defining a plenum, and

a plurality of hollow needles provided circumaxially in said molding chamber and oriented parallel to each other and to the central axis of said molding chamber, said needles having upstream ends communicating with said plenum and open downstream ends to create channels in the strand.

4,622,001

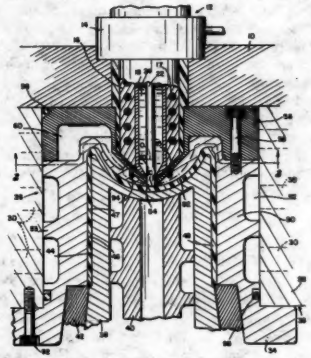
CAVITY COOLING SYSTEM

Stephen A. Bright, Troy; Philip L. Brun, Dayton; Mark C. Bercot, Piqua; Larry A. Beres, Tipp City; Jerry A. Brackney, Dayton; Timothy L. Bright, Greenville; David C. Hockaday, Wilmington, and Jeffrey L. Patrick, Dayton, all of Ohio, assignors to Electra Form, Inc., Vandalia, Ohio

Filed Mar. 12, 1985, Ser. No. 711,030

Int. Cl.[4] B29C *45/72*

U.S. Cl. 425—549 **20 Claims**



1. An injection molding machine having first and second mold members, the second member being movable with respect to the first, the first and second mold members cooperating to define a space into which molten plastic is injected to form an article of predetermined shape, a source of molten plastic including a nozzle, the first mold member including a gate aligned with the nozzle through which molten plastic is injected, a support member for supporting the first mold member including conduits for carrying liquid from a liquid cooling system, and a cap situated between the nozzle and first mold member having an aperture aligned with the gate, the cap having at least one tortuous channel on a surface adjacent the first mold member, the surface of the first mold member adjacent the cap including at least one pocket communicating with the at least one channel in the cap to define a liquid-conducting space connected in fluid communication with at least one of said conduits for directing cooled liquid between the nozzle and first mold member.

4,622,002

CONTAINER MOLDING APPARATUS

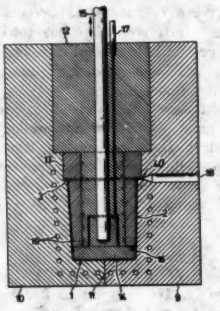
Horst Bormüth, Egelsbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 479,568, Mar. 28, 1983, abandoned. This application Jul. 23, 1984, Ser. No. 633,530

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 3213224

Int. Cl.[4] B29C *45/00, 45/42*

U.S. Cl. 425—577 1 Claim



1. Apparatus for injection molding a thin-walled plastic container, the container having an inner shape and an outer shape, a bottom wall, a side wall and a smooth, thickened flat sealing rim outwardly of the side wall for sealing the rim of the container with a covering sheet, the apparatus comprising two symmetrical mold halves that engage one another along a mold parting plane, each mold half having a recess corresponding to one half of the outer shape of the thin-walled plastic container to be manufactured, a core within the mold halves corresponding to the inner shape of the container, the core being spaced from the mold halves to produce a container having side and bottom wall thicknesses in the range of 0.25 to 0.75 mm, the core having a longitudinal axis in the mold parting plane and a runner arranged in one of the two mold halves terminating in a part of the mold cavity in which the sealing rim of the container is formed whereby a gate mark is formed by the runner on a outside surface of the sealing rim.

4,622,003

APPARATUS FOR DISPENSING ACTIVE MATERIALS

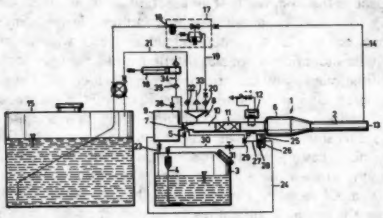
Paul Roth, Isny/Allgäu, Fed. Rep. of Germany, assignor to MOTAN Gesellschaft mit beschränkter Haftung, Isny, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,659

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337191

Int. Cl.[4] F23C *11/04*

U.S. Cl. 431—1 11 Claims



1. An apparatus for dispensing active material, said apparatus for portable spraying having an oscillating fire burner which operates with pulsating combustion and has an oscillating tube with a pulsating gas column operable in a resonance range at a predetermined pulsation pressure of said burner to which said active material is supplied via a discharge line from a tank for said active material; fuel being supplied to said burner from a fuel reservoir via a suction line;

the improvement therewith comprising: a control device operatively connected to provide a further fuel connection between said fuel reservoir and said burner to feed additional fuel to the latter in response to heat extraction from the pulsating gas column causing a drop in the pulsation pressure of said burner and to compensate for the pressure drop so that desired optimum pressure conditions prevail at which the apparatus operates in the resonance range and so that a maximum efficiency of the apparatus and a uniform and continuous dispensing of the active material are ensured.

4,622,004

GAS BURNER SYSTEM

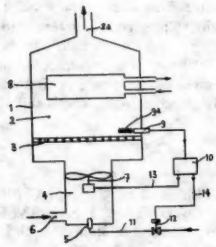
Peter B. Dalhuisen, At Ugchelen, Netherlands, assignor to Veg-Gasinstituut N.V., Apeldorn, Netherlands

Filed Feb. 4, 1985, Ser. No. 698,111

Claims priority, application Netherlands, Feb. 8, 1984, 8400406

Int. Cl.[4] F23N *5/00*

U.S. Cl. 431—76 9 Claims



1. A gas burner and control system therefor, which comprises

(a) means forming a closed combustion chamber having an inlet side and an outlet side,

(b) means forming a mixing chamber on the inlet side of said closed combustion chamber,

(c) a ceramic burner plate of low thermal conductivity, having distributed apertures therethrough, located at the inlet side of said closed combustion chamber,

(d) valve means for supplying combustion gas to said mixing chamber,

(e) controllable air supply means for supplying combustion air to said mixing chamber to be mixed with said combustion gas in controllable ratios of gas to air,

(f) a redox detector mounted within said closed combustion chamber for detecting the composition of products of combustion in said closed chamber,

(g) said redox detector being of the type which varies in electrical resistance as a function of the composition of the products of combustion,

(h) the arrangement of said redox detector and said closed combustion chamber being such as to provide for relatively constant temperature operation of said redox detector with varying loads in said combustion chamber, and

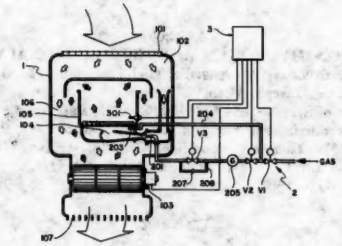
(i) control circuit means responsive to changes in resistance of said redox detector to controllably vary the gas and/or air supply to said mixing chamber to maintain efficient combustion therein.

4,622,005

IGNITION AND FLAME MONITORING DEVICE

Sinji Kuroda, Nagoya, Japan, assignor to Rinnai Corporation, Aichi, Japan

Filed Oct. 7, 1985, Ser. No. 784,295
Claims priority, application Japan, Oct. 27, 1984, 59-226165
Int. Cl.[4] F23N *5/00*
U.S. Cl. 431—78 3 Claims



1. An ignition and flame monitoring device comprising:
(a) sparking electrode members for igniting by a spark flammable gas issued from a burner and serving as a flame detecting element;
(b) a voltage transformer having a secondary coil connected in series with said sparking electrode members;
(c) a flame detection circuit connected in series with said sparking electrode members and said secondary coil of said voltage transformer so as to detect the presence or absence of the flame between said electrode members;
(d) a low voltage source connected in series with said flame detection circuit;
(e) an ignition control circuit adapted so that said transformer interrupts a voltage supply of said secondary coil by an output signal from said flame detection circuit upon building up a flame between said electrode members; and
(f) a voltage regulation diode member connected in parallel with said sparking electrode members and said secondary coil of said transformer, and the breakdown voltage being adapted to be between voltage supplied from said lower voltage source and that supplied from said secondary coil of said transformer so as to electrically disconnect between said lower voltage source and said flame detection circuit when subjected to voltage from said secondary coil of said transformer due to the occurrence of an avalanche breakdown inducing said spark.

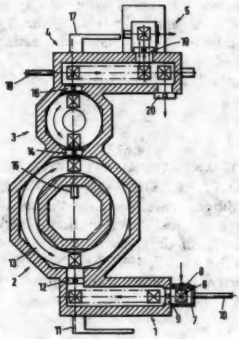
4,622,006

METHOD AND APPARATUS FOR HEAT TREATING METALLIC WORKPIECES USING A CONTINUOUS-HEATING FURNACE OR GRAVITY-DISCHARGE FURNACE

Paul Höhne, Kleve, Fed. Rep. of Germany, assignor to Ipsen Industries International Gesellschaft mit beschränkter Haftung, Kleve, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 757,271
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 8421677[U]; Nov. 13, 1984, 3441338
Int. Cl.[4] F27D *3/00;* C21D *1/62;* F27B *9/02*
U.S. Cl. 432—11 10 Claims

1. A method of heat treating metallic workpieces using a continuous-heating, pusher-type, or gravity-discharge furnace having at least two treatment chambers through which the workpieces successively pass; the chambers, which are provided with doors, serve to respectively treat a plurality of workpiece charges, with individual ones of said charges being cyclically received by the respective chambers, being conveyed through the latter while heat treatement is undertaken, and subsequently being released by said chambers;
the improvement therewith which comprises the steps of:
irregularly conveying said workpiece charges in at least one of said treatment chambers;
heat-treating said charges in said at least one of said treatment chambers;
varying retention times of the charges in said at least one of said treatment chambers wherein said heat treating is undertaken;



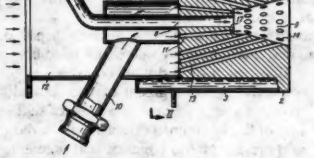
then releasing said charges from said at least one of said treatment chambers; and
thereafter introducing said charges into another of said heat treatment chambers for further heat treating and subsequently conveying another of said charges into said at least one of said heat treatment chambers;
said charges being released from said at least one treatment chamber only after said heat treating and said varying retention times.

4,622,007

VARIABLE HEAT GENERATING METHOD AND APPARATUS

Grigory M. Gitman, Duluth, Ga., assignor to American Combustion, Inc., Norcross, Ga.

Filed Aug. 17, 1984, Ser. No. 642,141
Int. Cl.[4] F27B *14/00;* F23D *11/10, 15/00;* F23M *3/04*
U.S. Cl. 432—13 44 Claims



1. An economizing method of hydrocarbon fluid fuel combustion in an ongoing hydrocarbon flamed formed in a combustion chamber within a fluid cooled combustion block, to reduce the consumption of fuel and pure oxygen in heating processes, comprising the steps of:
separately supplying hydrocarbon fluid fuel and two different oxygen based oxidizing gases to a fluid cooled combustion chamber;
directing said first oxidizing gas having a given oxygen concentration in a jet along the central axis of the combustion chamber;

directing said hydrocarbon fuel into said combustion chamber in a plurality of jets about the central jet of said first oxidizing gas so that said hydrocarbon fuel is caused to be mixed with said first oxidizing gas to stabilize combustion within the combustion chamber;

directing said second oxidizing gas having different oxygen concentration from said first oxidizing gas into said combustion chamber in a plurality of jets directed to mix inside said combustion chamber with said hydrocarbon fuel in the flame core, and to mix with the hydrocarbon fuel outside said combustion chamber, creating the final flame pattern; and

controlling the flow if said hydrocarbon fuel and said two oxidizing gases.

4,622,008

METHOD OF AND APPARATUS FOR THE THERMAL REGENERATION OF ADSORBENTS

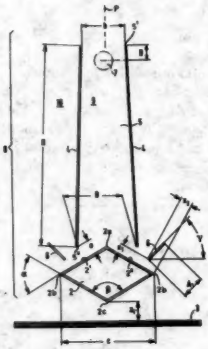
Peter Schulz; Jürgen Klein, and Knut Vaupel, all of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 7, 1984, Ser. No. 679,524

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344228

Int. Cl.[4] F27D *1/08*

U.S. Cl. 432—95 **18 Claims**



1. A regenerator for regenerating carbon adsorbent particles, comprising:

a regenerator housing having a perforated floor disposed above a plenum for receiving a fluidizing gas, haying a rectangular horizontal cross section and provided with a quartz sand fluidized bed at a height of 40–80 cm and a particle size of 1–2 cm;

a plurality of spaced apart baffle units disposed in said housing and surrounded by said bed while being spaced above said floor, each of said units comprising:

a respective guide segment of rhomboidal configuration having an edge located at a crest of said segment and a pair of flanks inclined downwardly and outwardly from said crest at lateral edges of said segment, said segment being spaced above said floor and extending transversely to horizontal longitudinal dimension of said housing,

a pair of walls disposed above said segment and spaced therefrom by respective clearances, said walls being inclined toward one another upwardly and having upper edges terminating at the level of said fluidized bed whereby respective shaft are formed by each pair of walls through which sand from the fluidized bed can pass downwardly and outwardly from said clearance, and

a pair of plates respectively spaced above said surfaces and inwardly of said lateral edges while being inclined to the horizontal;

means for introducing adsorbent particles to be regenerated into said shafts; and

means for collecting a mixture of gas and adsorbent particles from above said bed and separating the collected adsorbent particles from the gas collected therewith.

4,622,009

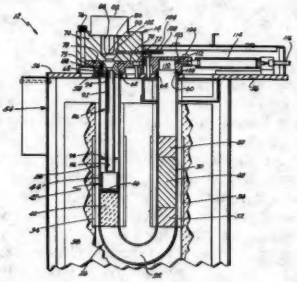
CARBON, HYDROGEN, AND NITROGEN ANALYZER

Roger L. Bredeweg, Stevensville, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Division of Ser. No. 699,574, Feb. 8, 1985, Pat. No. 4,573,910, which is a division of Ser. No. 355,214, Mar. 5, 1982, Pat. No. 4,525,328. This application Sep. 20, 1985, Ser. No. 778,309

Int. Cl.[4] F27B *14/00*; G01N *31/00, 31/12*

U.S. Cl. 432—156 **9 Claims**



1. A combustion furnace for the combustion of a sample into constituent gases comprising:

a U-shaped tubular combustion device including a vertically oriented tubular combustion portion having upper and lower ends, a vertically oriented tubular reagent portion having upper and lower ends, and a tubular bight portion interconnecting said lower ends of said combustion and reagent portions, said tubular combustion and reagent portions being parallel to and spaced from one another;

crucible means in said furnace portion above said bight portion for supporting the sample during combustion;

heater means above said bight portion for heating said combustion portion; and

sample-dropping means at said upper end of said combustion portion for dropping the sample into said crucible means.

4,622,010

ENOSSAL IMPLANT FOR SECURING A TIGHT-FITTING TOOTH REPLACEMENT

Werner L. Koch, Liebenau, Fed. Rep. of Germany, assignor to Implanto-Lock GmbH, Fed. Rep. of Germany

Filed Nov. 16, 1984, Ser. No. 647,107

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1984, 3331868

Int. Cl.[4] A61C *8/00*

U.S. Cl. 433—173 **12 Claims**

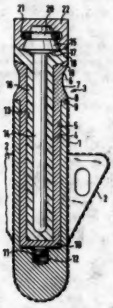
1. An enossal implant for holding a resiliently-mounted, tight-fitting tooth replacement comprising

a rigid metal tube insertable into the jaw bone

a threaded bore within said tube

a removable insert for said tube having a threaded rigid metal peg for screwing into said bore to lock the tube to the insert

a pin disposed within said insert for mounting said tooth replacement on the outer end thereof and



an intermediary resilient sleeve positioned between and bonded to said pin and said insert.

4,622,011

RADICULAR POST HEAD COMPRISING REVERSIBLE RETENTION AND AUTOMATIC POSITIONING MEANS

Pierre Malek, 62, boulevard Gambetta, 06000 Nice, France

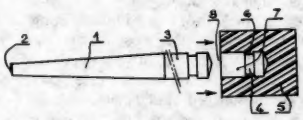
PCT No. PCT/FR83/00260, § 371 Date Aug. 17, 1984, § 102(e) Date Aug. 17, 1984, PCT Pub. No. WO84/02463, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 20, 1983, Ser. No. 643,617

Claims priority, application France, Dec. 29, 1982, 82 22203

Int. Cl.[4] A61C *5/08*

U.S. Cl. 433—221 **2 Claims**



1. The combination of a radicular post and a resilient dental impression for use in preparing a cap to be fixed to a tooth having a post hole shaped to receive the post,

the post comprising a conical part for entering the post hole, the post having a cylindrical part which extends from the tooth when the post is seated in the post hole and the cylindrical part having retention groove means circularly disposed around it, and the conical part and the cylindrical part and the groove means being fully symmetrically disposed about the longitudinal axis of the post; and

the impression comprising a cured resilient compound having a molded hole fitting the cylindrical part of the post, and the impression having resilient ring means in the molded hole shaped to enter and fill the groove means in the post, the shape of the groove means and the resilience of the impression being selected such that the cylindrical part of the post can be removed from and re-positioned within the molded hole in the impression without damaging the impression and while achieving accurate positioning of the post therein because the parts of the post are symmetrical about said longitudinal axis.

4,622,012

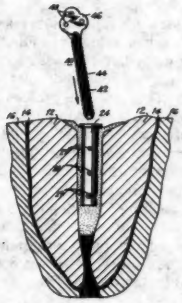
DENTAL POST SYSTEM

Lewis S. Smoler, 450 Plandome Rd., Manhasset, N.Y. 11030

Filed Mar. 27, 1985, Ser. No. 716,489

Int. Cl.[4] A61C *5/08*

U.S. Cl. 433—221 **19 Claims**



7. A method of restoring a damaged or diseased tooth having a tooth root with a root canal, comprising

decornating said tooth at a cervix thereof to expose said canal;

reaming out said canal with a reaming device;

preparing said canal suitably for insertion of a post;

loosely positioning in the reamed-out, prepared canal an outer post to form a space between said outer post and said canal, the outer post being formed of a peforated, open-ended generally cylindrical hollow body;

injecting a hardenable composite paste material into the canal through said outer post;

inserting into the outer post an inner post having a serrated post portion and a head portion at a proximal end of the post portion, the insertion including forcing said composite paste material through perforations in said hollow body outer post to fill the space between said canal and said outer post, said head portion being exposed above the tooth root;

forming a crown core of a hardenable composite material on the tooth root and over the head portion of the inner post, the latter serving as an anchor for the crown core; and

attaching an artificial crown over said crown core.

4,622,013

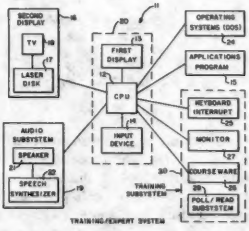
INTERACTIVE SOFTWARE TRAINING SYSTEM

Gerard J. Cerchio, San Jose, Calif., assignor to Interactive Research Corporation, Santa Clara, Calif.

Filed May 21, 1984, Ser. No. 612,760

Int. Cl.[4] G09B *19/00*

U.S. Cl. 434—118 **24 Claims**



1. An interactive training system for training a person to use a preselected computer program, comprising:

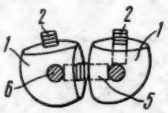
(a) a computer subsystem including
CPU means for executing computer programs,
input means for entering data into said system, and
display means for displaying the results of executing a computer program in said CPU;
(b) means for loading said preselected computer program in said computer subsystem; and
(c) tutor means comprising a second distinct computer program resident in said computer subsystem for training said person to use said preselected computer program while said computer subsystem runs said preselected computer program, wherein said second distinct computer program operates as a coroutine to said preselected computer program, said tutor means including:
a courseware database for defining a tutorial for training a person to use said preselected computer program, including data structures for defining, in accordance with the contextual circumstances in the running of said preselected computer program, (a) criteria for determining whether said input data is to be processed by said preselected computer program, and (b) tutorial messages to be displayed on said display means in response to said input data;
interrupt means for interrupting the flow of data from said input means to said preselected computer program so that said input data can be compared with said courseware database criteria,
monitor means for interpreting and manipulating said input data, selectively generating tutorial messages in reponse to said input data, and selectively allowing a subset of said input data to be processed by said preselected computer program; said interpreting, manipulating, generating and allowing functions being dynamically determined in accordance with predefined criteria in said courseware database dependent on the contextual circumstances in the running of said preselected computer program, and
display control means for separately displaying said tutorial messages and the output from said preselected computer program so that said person can distinguish tutorial messages from normal output from said preselected computer program;
wherein the content and flow of said tutorial is defined by said data structures in said courseware database.

4,622,014

THREE-DIMENSIONAL MODEL OF MOLECULAR STRUCTURE

Faik-Khilo N. Mikelsaar, Tartu, U.S.S.R., assignor to Tartusky Gosudarstvenny Universitet, Tartu, U.S.S.R.

PCT No. PCT/SU84/00021, § 371 Date Nov. 8, 1985, § 102(e) Date Nov. 8, 1985, PCT Pub. No. WO85/04745, PCT Pub. Date Oct. 24, 1985
PCT Filed Apr. 18, 1985, Ser. No. 798,695
Int. Cl.[4] G09B *23/26*
U.S. Cl. 434—278 **1 Claim**



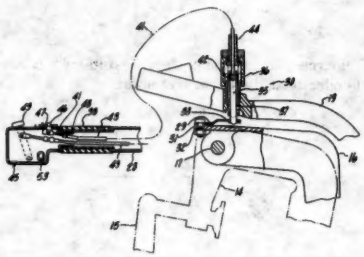
1. A three-dimensional model of a molecular structure, comprising plastic modules (1) imitating each one atom of the molecular structure being modeled, interconnected by connecting members (2) of a cylindrical shape, receivable in the sockets (5) of each module, the shape of these sockets (5) complementing the shape of the connecting member (2), characterized in that each plastic module (1) has arranged centrally thereof an element (6) shaped as a sphere or a part of a sphere, and each connecting member (2) includes an insert (7) extending axially thereof, the spherical element (6) and the insert (7) being made of an X-ray contrast material to produce on an X-ray photograph of the model the images (9,10) of the centres of the plastic modules and representing of the chemical bonds of the modeled molecular structure.

4,622,015

STEERING DEVICE FOR AN OUTBOARD MOTOR

Yukio Sumigawa, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Aug. 15, 1984, Ser. No. 640,879
Claims priority, application Japan, Aug. 22, 1983, 58-151617
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—55 **11 Claims**



1. In a steering mechanism for an outboard motor or the like comprising a clamping bracket adapted to be affixed to the transom of a watercraft, a drive shaft housing, a steering shaft affixed to said drive shaft housing, a swivel bracket carried by said clamping bracket for pivotal movement about a horizontally extending axis, said steering shaft being supported for steering movement about a generally vertically extending steering axis by said swivel bracket, a steering bracket affixed to said steering shaft for steering of said drive shaft housing about said steering axis, an elongated tiller pivotally connected to said steering bracket for controlling steering movement of said motor about said steering axis, and releasable restraining means comprising a pair of positively interengaging elements for retaining said motor is a preset steered condition, the improvement comprising one of said elements being fixed relative to said swivel bracket and the other of said elements being carried by said steering bracket whereby said elements will pivot together about said horizontally extending axis, operating means carried at the forward end of said tiller for selectively controlling said releasable restraining means from said tiller and a flexible cable extending through said tiller for connecting said operating means to said releasable restraining means.

4,622,016

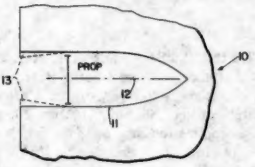
TUNNEL WEDGE

Donald W. Hankley, Virginia Beach, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 20, 1980, Ser. No. 208,754
Int. Cl.[4] B63H *5/16*
U.S. Cl. 440—70 **2 Claims**

1. A device for reducing the shaft horsepower required to attain an operating speed in a waterborne craft, said craft having a bottom, a bow, a stern and a semi-cylindrical shaft tunnel in the bottom housing a propeller shaft and propeller,

said tunnel opening to the bottom and to the stern of the craft, comprising:



a semi-cylindrical wedge positioned on an inner surface of the shaft tunnel to reduce the exit area of the tunnel in the bottom and stern of the craft.

4,622,017

OAR WITH PIVOTAL BLADES

Gilles McGraw, 4236 Delanaudiere, Montreal, Quebec, Canada H2J 3N9

Filed May 25, 1984, Ser. No. 614,739
Claims priority, application Canada, May 25, 1983, 428890
Int. Cl.[4] B63H *16/04*
U.S. Cl. 440—101 **16 Claims**

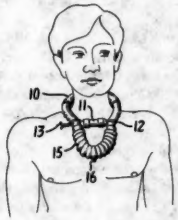
6. A device for propelling a vessel through water, said device comprising a shaft having two parallel grooves of circular cross-section extending throughout the length of the shaft, each groove pivotally supporting a blade and having a peripheral extent which permits the blades to pivot between a position in which they are parallel and a further position in which they project in opposite directions in a common plane, said device including means for locating and retaining the blades axially relative the the shaft.

4,622,018

FLOATABLE COLLAR

Max A. Blanc, St. Jean de Luz, France, assignor to William B. Anderson, West Palm Beach, Fla., a part interest

Filed Apr. 3, 1985, Ser. No. 719,722
Int. Cl.[4] B63C *9/16*
U.S. Cl. 441—123 **7 Claims**



1. A floatable safety device comprising a floatable collar capable of being placed around the neck of a swimmer, said collar including a non-inflatable, relatively rigid U-shaped portion that extends around the back of the swimmer's neck and an inflatable and expandable tubular portion that connects the ends of the U-shaped portion, a buoyant, hollow chin bar subdividing the collar so that a subdivided portion of the collar which excludes the inflatable and expandable portion encircles the swimmer's neck to provide buoyancy to help keep the swimmer's head afloat without disengaging the collar from the neck of the swimmer, and means connecting the ends of the chin bar across the U-shaped portion for adjustment relative to the said U-shaped portion of the collar to facilitate tightening of the collar and chin bar around the swimmer's neck.

4,622,019

TOY FIGURINE AND ENVIRONMENT PLAYSET

Allison W. Katzman, Chicago; Donald A. Rosenwinkel, and Wayne A. Kuna, both of Oak Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Continuation of Ser. No. 575,870, Feb. 1, 1984, abandoned. This application Sep. 27, 1985, Ser. No. 782,595
Int. Cl.[4] A63H *23/00*
U.S. Cl. 446—153 **20 Claims**

1. A toy figurine that floats in water having a vertical center line and comprising:

a hollow upper portion including a head with a section extending off center of the vertical center line;

a hollow lower "J" shaped portion with the bottom end forming a spiral tail section extending off center of the vertical center line;

means connecting said upper and lower portions to each other; and

a rigid weight secured inside the spiral tail section with the balance of said weight offset from the vertical center line for submerging the lower portion in the water while substantially maintaining the head above the surface of the water without the need for any external weight.

4,622,020

GLOVE PUPPET FIGURE ASSEMBLY AND PO"VERED WING DRIVE MECHANISM

Francis R. Amici, Northford; Hans S. Berger, Plainville; Domenic G. Mercurio, Elmwood; John P. McNett, Farmington, and Pietro Piazza, Prospect, all of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 11, 1985, Ser. No. 700,532
Int. Cl.[4] A63H *3/28*
U.S. Cl. 446—298 **19 Claims**

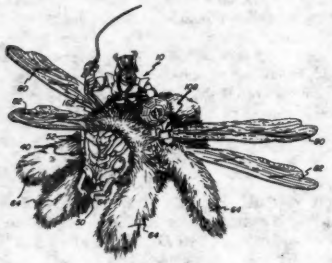
1. In a winged creature toy, a readily removable artificial wing assembly comprising:

a wing member fabricated from a sheet of synthetic resinous material and having an outer portion and an inner connecting portion, said outer portion being constructed to simulate the wing of a creature, and said inner portion tapering therefrom and being longitudinally pleated;

a supporting piece having inner and outer end portions; and

a coupling member having an inner part defining a first inwardly extneding socket portion into which said outer end portion of said supporting piece is inserted to disengageably mount said coupling member thereon, and a

flared outer part defining a second inwardly extending socket portion into which said inner connecting portion of said wing member is inserted for mounting said wing member on said coupling member, said coupling member



being fabricated from a resiliently deflectable material and being configured to permit relative deflection of said parts thereof to permit movement of said wing member relative to said supporting piece.

4,622,021

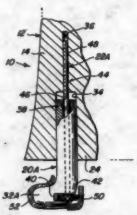
DOLL THAT GROWS

Joseph M. Darrigo, Sr., 27 Seneca St., Staten Island, N.Y. 10310

Filed Oct. 24, 1985, Ser. No. 790,979

Int. Cl.[4] A63H *3/36*

U.S. Cl. 446—320 **2 Claims**



1. A doll that grows which comprises:

(a) a main body portion being a torso with a head and a pair of arms attached thereto;

(b) a pair of legs; and

(c) means for adjustably securing said legs to a bottom portion of said torso for movement between a retracted position and an extended position with respect to said torso, wherein said adjustably securing means includes said bottom portion of said torso of said main body portion having a pair of apertures, each of said apertures is for accepting and concealing a substantial length of each of said legs to simulate growth for said doll between said retracted position and said extended position, wherein said adjustably securing means further includes:

(i) each of said apertures having a threaded hole in axial alignment;

(ii) each of said legs terminating at its lower distal end in a foot and having an axial bore therethrough with a transverse slot at a heel portion of said foot; and

(iii) a pair of leg extension controls, each of said controls being an elongated rod having a threaded portion at its upper proximal end and a knurled head at its lower distal end, said elongated rod extending through said axial bore with knurled head in said transverse slot and said threaded portion in engagement with said threaded hole so that said knurled head can be turned for moving and retaining said leg between said retracted position and said extended position without sliding loosely.

4,622,022

TELESCOPING TUBES FOR TORQUE TRANSMISSION

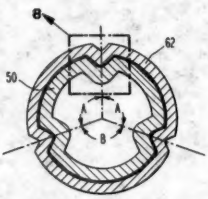
Harold R. Diffenderfer, and George S. Rowley, both of Pottstown, Pa., assignors to Neapco, Inc., Pottstown, Pa.

Continuation of Ser. No. 505,770, Jun. 20, 1983, abandoned.

This application Sep. 6, 1985, Ser. No. 773,523

Int. Cl.[4] F16C *3/03;* F16D *3/06*

U.S. Cl. 464—162 **4 Claims**



1. A telescoping torque transmitting joint comprising:

inner and outer generally cylindrical telescoping tubes, said tubes being sized to fit relatively closely to one another and having a plurality of mating, inwardly extending lobes, said lobes running longitudinally along said tubes, the lobes formed on the inner one of said tubes being adapted to matingly engage the lobes formed on the outer one of said tubes, said lobes being generally of Vee-shape, said Vee shaped lobes having an angle between about 60° and about 120°, each said Vee-shaped lobe defining two corners and a trough, said corners adjoining adjacent cylindrical tube sections, the corners of said Vee-shaped lobes being relatively sharp, and the thickness of said tubes being greater across the corners of said Vee-shaped lobes than of said cylindrical tube sections, such that mating surfaces of said lobes are substantially flat across their width, said mating surfaces of said lobes being symmetrical about a line passing through the trough of the Vee-shaped lobes and a concentric axis of said tubes, whereby torque can be transmitted from one of said tubes to the other in either direction of rotation by engagement of said mating surfaces formed by said inwardly extending lobes, and whereby said mating surfaces have substantial width as well as length extending axially along said tubes.

4,622,023

BELT PULLEY AND METHOD OF MAKING THE SAME

Terrence R. Quick; Paul M. Standley; Mark P. Foley, all of Springfield; Anderson W. Howerton, Christian County; Joseph P. Miranti, Jr., Porter Township, Christian County; Larry R. Oliver; Gerald C. Holloway, Jr., both of Springfield, and Kenneth D. Richmond, Garden Grove Township, Christian County, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 413,031, Aug. 30, 1982, Pat. No. 4,525,150.

This application Apr. 1, 1985, Ser. No. 718,616

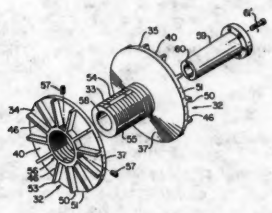
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.

Int. Cl.[4] F16H *57/04*

U.S. Cl. 474—93 **10 Claims**

1. In a method of making a belt pulley having a hub and a peripheral groove for receiving part of an endless belt therein that is to drive said pulley or be driven thereby whereby said pulley is adapted to be rotated about a longitudinal axis of said hub, said method comprising the steps of forming said pulley to have a pair of opposed facing sides defining at least part of said groove therebetween and have a pair of oppositely facing outboard sides, forming said sides to each have an inner periph-

eral portion and an outer peripheral portion, forming said pulley to have a plurality of circumferentially spaced apart and radially disposed substantially straight vanes extending outwardly from said outboard sides thereof, and forming each said vane to have an inner peripheral end and an outer peripheral and respectively disposed adjacent said inner peripheral portion and said outer peripheral portion of its respective outboard side and have an outer edge that is disposed substantially transverse to said longitudinal axis of said hub from substantially said inner peripheral end thereof to said outer peripheral



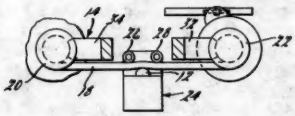
end thereof and is spaced outwardly from said respective outboard side from substantially said inner peripheral end thereof to said outer peripheral end thereof whereby said vanes are adapted to act on fluid adjacent said pulley to tend to cool said pulley with said fluid, the improvement comprising the steps of forming a pair of plate means respectively carrying said vanes thereon, securing said plate means to said outboard sides of said pulley to rotate in unison therewith, carrying parts of said hub on each of said plate means, and securing said parts of said hub to each other to define said hub of said pulley.

4,622,024

APPARATUS AND METHOD FOR PRESTRETCHING AND TENSIONING FLEXIBLE DRIVE MEMBERS

Lawrence J. Lawson, Troy, Mich., assignor to Dominion Tool & Die Company, Roseville, Mich.

Filed Apr. 30, 1984, Ser. No. 605,490
Int. Cl.[4] F16H 7/10
U.S. Cl. 474—102 **7 Claims**



1. A method for prestretching and tensioning an interconnecting member extending between a pair of relatively movable members, said method comprising:

applying sensor means to said interconnecting member, said sensor means being operative to provide a signal proportional to the tension exerted on said interconnecting member to control means;

installing force generating means for moving one of said relatively movable members with respect to the other movable member to thereby selectively vary the tension of said interconnecting member;

actuating said control means to operate said force generating means so as to increase the tension on said interconnecting member until said sensor provides a signal of a first predetermined value to said control means, said control means thereafter actuating said force generating means to decrease the tension on said interconnecting member until said sensor provides a signal of a second predetermined value to said control means;

said control means thereafter actuating said force generating means to adjust the tension on said interconnecting member until said sensor means provides a signal of a third predetermined value to said control means, said control means thereafter maintaining said force generating means whereby the tension on said interconnecting member is maintained at a level corresponding to said third predetermined value;

securing fastener means associated with said movable one of said relatively movable members so as to secure said movable member in a position whereby the tension on said interconnecting member is maintained at said level by said relatively movable members; and

thereafter removing said sensor and said force generating means.

6. Apparatus for selectively tensioning a flexible drive member extending between a relatively fixedly supported rotatable member and a relatively movably supported rotatable member, said apparatus comprising:

central control means;

sensor means removably attached to said flexible drive member and independent of the tensioning of the drive member and operative to continuously directly sense the tension exerted on said flexible drive member and supply a signal proportional thereto to said control means;

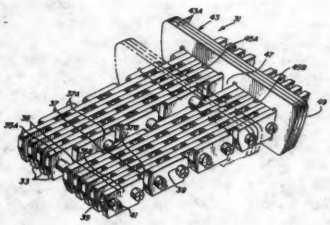
force generating means operatively connected to said control means, said force generating means being operative to effect non-rotating movement of said movably supported rotatable member whereby the tension on said flexible member may be varied under the control of said control means and in response to said signal received from said sensor.

4,622,025

CHAIN-BELT

John M. Kern, and George A. Zimmer, both of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 1, 1984, Ser. No. 656,282
Int. Cl.[4] F16G 1/21
U.S. Cl. 474—245 **14 Claims**



1. An improved endless, flexible chain-belt for drivingly connecting the pulleys of a pulley transmission, each pulley of which is constructed of a pair of flanges to define therebetween a generally V-shaped space, said chain-belt comprising:

a plurality of sets of links with the links of one set interleaved with the links of the next adjacent set, each link defining a pair of apertures, each of which is near the ends thereof with the apertures in a set of links transversely aligned with one another to define groups of apertures, one group of apertures in one set of links being transversely aligned with a group of apertures in the next adjacent and interleaved set of links;

pivot means in each aligned group of apertures to connect the links and permit articulation of the sets of links relative to the next adjacent and interleaved sets of links, each of said pivot means defining an axis about which the links pivot; and

a plurality of drive blocks, each of which defines at least one window, permitting each block to encircle a set of links, each drive block being generally V-shaped and having a

pair of side drive surfaces adapted to drivingly contact the pulley flanges, each window defining a horizontal line locating the initial point of pulley contact with said block, said side drive surfaces having a major portion thereof crowned so as to present a convex surface to said pulley flanges, each convex surface having a radius of curvature of a magnitude of from five to fifty times or more of the width of the drive block.

4,622,026

MANDREL FOR USE IN MANUFACTURING AN ANGLED AND CYLINDRICAL CONTAINER

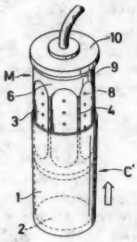
Sukenori Ito, Fuchu; Yoshiaki Take, Tama, and Takahisa Hirayama, Kiryu, all of Japan, assignors to Toppan Printing Co., Ltd., Japan

Division of Ser. No. 627,435, Jul. 3, 1984, Pat. No. 4,581,003. This application Nov. 29, 1985, Ser. No. 803,052

Claims priority, application Japan, Jul. 8, 1983, 58-124446; Jul. 8, 1983, 58-124447; Jul. 8, 1983, 58-124448; Jul. 8, 1983, 58-124450

Int. Cl.[4] B31B *1/90*

U.S. Cl. 493—104 **3 Claims**



1. A mandrel for use in manufacturing a container comprising a mandrel body having an outer surface substantially corresponding to the shape of a cylinder, a plurality of recessed portions located about the circumference of said mandrel body, said plurality of recessed portions forming said mandrel body into a shape having a cross-section substantially corresponding to a shape of a polygon whose sides are inwardly depressed from said substantially cylindrical outer surface to form curved surfaces, a plurality of connecting portions separating said plurality of recessed portions, said plurality of connecting portions being located substantially at said cylindrical outer surface of said mandrel, a central channel located within said mandrel, and a plurality of apertures located within said plurality of recessed portions and connecting said plurality of recessed portions with said central channel, whereby a vacuum can be applied through said plurality of apertures to conform a container body placed upon the outer surface of said mandrel to the shape of said mandrel.

4,622,027

METHOD OF MAKING A CONTAINMENT BAG

James M. Parish, Wadsworth, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Nov. 23, 1984, Ser. No. 674,450

Int. Cl.[4] F16G *13/02*

U.S. Cl. 493—226 **5 Claims**

1. The method of fabricating a containment bag comprising the steps of securing a pair of heat sealable panels that have a pair of side edges that taper at one end into an end edge, joining together one side edge of said panels by heat sealing up to adjacent points on each of said end edges, joining an elongated narrow heat sealable panel having a flared one end edge and two side edges by heat sealing said flared one edge to said end edges of said joined panels with said flared edge of said narrow panel equal in length to said joined end edges of said pair of panels, and forming said narrow panel into a conduit with an open end conduit end by joining the above said side edges of said elongated narrow heat sealable panel through heat sealing and continuing to heat seal and join said other side edges of

said pair of panels to form a bag with an opening opposite in direction from said open end at said conduit end which conduit ends can be closed off to retain fluids in said bag.

4,622,028

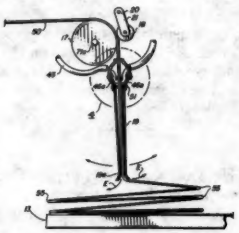
DELIVERY MECHANISM FOR PAPER SHEET PROCESSING APPARATUS

Ernest B. Bunch, Jr., 9619 N. 21st Dr., Phoenix, Ariz. 85021

Continuation of Ser. No. 148,716, May 12, 1980, abandoned. This application Dec. 4, 1984, Ser. No. 677,996

Int. Cl.[4] B65H *45/105, 45/107*

U.S. Cl. 493—413 **1 Claim**



1. Apparatus for producing and delivering continuous form stationery by folding a strip of paper along transverse lines of weakening formed therealong, said apparatus including

(a) a frame;

(b) means comprising an oscillating chute having a mouth and mounted on said frame for alternately distributing at least some of said lines of weakening in said paper strip through said mouth in substantially opposite directions;

(c) roller means mounted on said frame for continuously feeding and dispensing said strip of paper into said oscillating chute, said paper strip traveling through said chute and said mouth of said chute to be distributed and folded in a zig-zag fashion;

(d) folding means carried on said frame and operatively associated with said oscillating chute for receiving and urging said paper strip distributed by said chute into a folded condition, said folding means including

(i) means comprising spirals shaped and dimensioned to receive and carry away from said oscillating chute creased edges of said paper distributed through said mouth of said chute,

(ii) beaters for periodically tamping said paper strip distributed through said mouth of said chute, said beaters assisting in the folding and positioning of said paper strip;

(e) means comprising a support surface carried on said frame for receiving paper dispensed by said beaters and spirals;

(f) orifice means mounted on said frame for directing at least one stream of air into said chute to flow through said chute in a direction of travel generally parallel to the direction of travel of said paper strip through said oscillating chute, said air stream

(i) contacting said strip of paper when said strip passes through said chute,

(ii) exiting through said mouth of said chute with said strip of paper, and

(iii) assisting the movement and facilitating the distribution and zig-zag folding of said paper strip along said transverse lines of weakening therein and allowing utilization of said continuous form stationery folding apparatus at higher operational speeds; and,

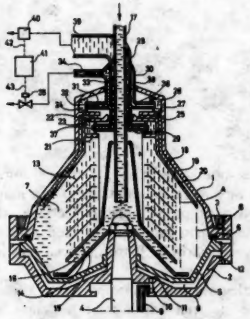
(g) means operatively associated with and connected to said orifice means for delivering to said orifice means air under pressure to be directed by said orifice means into said chute.

4,622,029

ARRANGEMENT IN CONNECTION WITH A CENTRIFUGAL SEPARATOR

Vilgot Nilsson, deceased, late of Hagersten, Sweden (by Mary Nilsson, Goran Nilsson, heirs), assignor to Alfa-Laval Marine and Power Engineering AB, Tumba, Sweden

Filed Dec. 19, 1984, Ser. No. 683,622
Claims priority, application Sweden, Dec. 21, 1983, 8307075
Int. Cl.[4] B04B *11/00*
U.S. Cl. 494—2 **6 Claims**



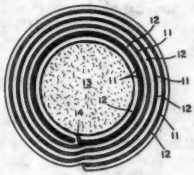
1. In a centrifugal separator including a rotor forming a separating chamber and having an inlet for delivering to said chamber a mixture of two liquid components to be separated, the rotor also having a central outlet chamber for receiving the heavier of said components through flow connection from the separating chamber, the separator having an outlet for the lighter of said components, a stationary outlet member forming a channel leading from said outlet chamber and the rotor to an external reception place for the separated heavier component and valve means operable during rotation of the rotor to alternately allow and prevent liquid flow through said channel from the outlet chamber to said reception place, the improvement in which said flow connection to the outlet chamber includes calibrated opening means for limiting the liquid flow into the outlet chamber, said outlet chamber having stationary calibrated outlet means for discharging liquid from the outlet chamber while said valve means prevents liquid flow through said channel, said calibrated opening means and said calibrated outlet means having respective throughflow areas calibrated to allow equal rates of liquid flow therethrough at a predetermined liquid level in the outlet chamber while said valve means prevents flow through said channel.

4,622,030

REVERSE FOLDED CONVOLUTELY WOUND TAMPON TUBE

Donald A. Sheldon, and Richard R. Tews, both of Outagamie County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 23, 1984, Ser. No. 603,065
Int. Cl.[4] A61F *13/20*
U.S. Cl. 604—15 **8 Claims**



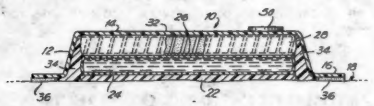
1. A convolutely wound cellulosic outer tampon tube said tube comprising a low-friction inner surface and a low-friction outer surface and adhesive bonding means to maintain said tubular configuration wherein said tube is wound from a blank having a low-friction surface and an adhesive-coated nonlow-friction surface said adhesive-coated surface is folded upon itself at one end of said blank prior to winding said tube with said adhesive-coated faces in face-to-face contact in the fold to create an area that forms a low-friction inner surface after winding.

4,622,031

INDICATOR FOR ELECTROPHORETIC TRANSCUTANEOUS DRUG DELIVERY DEVICE

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Continuation-in-part of Ser. No. 524,252, Aug. 18, 1983, Pat. No. 4,557,723. This application Oct. 12, 1984, Ser. No. 660,192
The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.
Int. Cl.[4] A61N *1/30*
U.S. Cl. 604—20 **12 Claims**



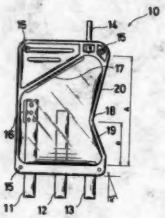
1. A self-contained electrically powered drug applicator for the administration of a medicament through the skin of the blood stream of a patient comprising, reservoir means containing said medicament and forming an electrode, battery means, for charging/driving the medicament, adjacent one side of said reservoir means and being electrically connected therewith, cover means for covering comprising an electrically conductive material for partially enclosing at least said reservoir means, and being electrically connected to said battery means, the other side of said reservoir means being exposed for contacting said skin, said cover means having a lip-like electrode for making contact with said skin when mounted on said skin, and an electrically conductive adhesive material coating disposed on the underside of said lip-like electrode which is in contact with said skin, said applicator when adhered to said skin forming a complete electrical circuit through said skin, wherein with the completion of said circuit via said reservoir means, skin, lip-like electrode and battery means, said medicament migrates out of said reservoir means and through said skin into the blood stream of said patient, and indicator means

in said circuit indicating delivery of said medicament to the patient.

4,622,032
BLOOD RESERVOIR

Yoshiro Katsura, Fuji; Kazuhiko Hagiwara, and Osamu Nomura, both of Fujinomiya, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,568
Claims priority, application Japan, Oct. 27, 1984, 59-226584
Int. Cl.[4] A61M *1/03*; B01D *19/02*
U.S. Cl. 604—122 **5 Claims**

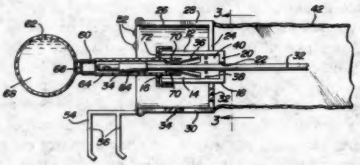


1. A blood reservoir comprising:
a hollow container of a flexible synthetic resin defining a space for containing blood therein,
vent means provided at an upper portion of said container in communication with the space of said container for venting air therefrom,
blood inlet means and blood outlet means each communicating with the space of said container,
said blood inlet means including a tubular member extending into the space through a lower portion of said container, a closed top end and a plurality of blood inlet openings formed in a region of the wall of said tubular member below said closed top end, and
said blood outlet means being located near the lower portion of the space for discharging blood therefrom, and
a projected portion is provided on one side of the inner surface of said container that is remoter from said blood inlet means and nearer to said blood outlet means, said projected portion being projected into the container space at about the intersection between said one side and the horizontal plane of said blood inlet openings.

4,622,033
AUTOMATED CATHETER CONSTRUCTION

Tokuso Taniguchi, 277 Kaiulani St., Hilo, Hi. 96720

Filed Aug. 8, 1984, Ser. No. 639,269
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—172 **12 Claims**



1. A catheter assembly including an elongated tubular body having opposite open ends, a catheter having its distal end slidingly and guidingly telescoped into one end of said body, a lubricant reservoir from which lubricant may be expressed and including a tubular outlet neck telescoped into and in axial alignment with the other end of said body and over said distal and of the catheter, said outlet neck and body including coacting means engaged with the outer surface of the catheter and operative to lightly clampingly engage said catheter to prevent longitudinal shifting of the latter relative to said body responsive to penetration of said outlet neck into said other end of said body with the clamping force being exerted solely by said outlet neck, whereby lubricant discharged from said outlet neck into said body and toward said one end thereof will not be effective to shift said catheter proximally in said body, said one end of said body including a centrally apertured end wall at said one end of said body and extending radially inwardly thereof loosely receiving said catheter therethrough, said body including an apertured partition therein centrally through which said catheter is slightly received, said apertured partition being disposed intermediate said end wall and said coacting means, the interior of said body between said partition and said end wall defining a lubricant chamber for lubricating said catheter proximally of said distal end during distal shifting of said catheter relative to said body during insertion of said distal end through the urethra and into the bladder.

4,622,034
MEDICAL TUBE HOLDER

Bruce T. Shattuck, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Filed Feb. 27, 1985, Ser. No. 705,985
Int. Cl.[4] A61M *25/02*
U.S. Cl. 604—179 **7 Claims**

4. A medical tube holding device comprising:
an elongate flexible strip of resilient foam material;
a flexible strip of porous material coextensive with said flexible foam strip having a surface smoother than the surface of said strip of foam material and integral therewith;
means for releasably securing one end of said integral foam and porous material strip to the other end of said strip; and
aperture means extending through said strip for receiving a medical tube near the other end of said integral foam and porous material strip, the medical tube receiving means at said other end of said integral foam and porous material strip being operable to secure a medical tube in place in cooperation with the means for releasably securing the other end of said integral foam and porous material strip when said aperture means and said means for releasably securing the other end of said integral foam and porous material strip are in alignment.

4,622,035
BOOT WITH CONTINUOUS MEDICAMENT SUPPLY

Betty Palmer, 3064 Towerway Dr., Chattanooga, Tenn. 37406, and Norman E. Reitz, P.O. Box 2630, Menlo Park, Calif. 94026

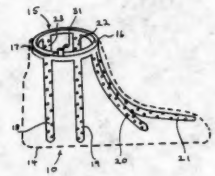
Filed Jan. 23, 1985, Ser. No. 693,874
Int. Cl.[4] A61M *35/00*
U.S. Cl. 604—293 **8 Claims**

1. A boot having a continuous supply of lotion for dermatological therapeutic treatment of human foot ailments, comprising:
a boot having an opening shaped to enclose a human foot up to at least about the ankle level, said boot having an inte-

gral toe portion and heel portion for accomodating, respectively, the toe and heel of said foot, said boot having an outer covering having an inner and outer surface which is impervious to said lotion;

an absorbent lining of narrow gauge disposed around the inner surface of said outer covering of said boot;

a reservoir having a supply of of lotion affixed to said boot and having an externally accessible opening for receiving said lotion; and



a lotion supply network means within said boot between said absorbent lining and said outer covering, said supply network consisting of a plurality of of low angle elliptically shaped hollow supply fingers which extend from said reservoir in fluid communication there of to the extremities of said boot along the inside contours of said outer covering, said supply fingers having openings through which lotion may flow to reach selected areas of said absorbent lining.

4,622,036

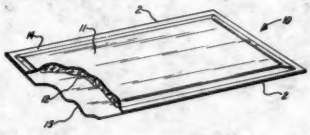
POROUS FILM AND ABSORPTIVE STRUCTURE

Richard W. Goodrum, Richmond, Va., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 365,424, Apr. 5, 1982, abandoned. This application Jul. 2, 1984, Ser. No. 627,027

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—367 **17 Claims**



1. A liquid permeable sheet material having the feel and resemblance of soft cloth consisting essentially of particles of non-dissolvable polyolefin or polyvinylchloride polymeric materials partially fused together by heat so as to provide a desired amount of liquid permeability through the spaces provided by the partial fusion of said particles, said particles ranging in size, from about one micron to about 2000 microns, and said sheet having a thickness of about 0.0005 inches to about 0.25 inches.

4,622,037

BLEACHING COTTON-CONTAINING FABRICS WITH HYPOCHLORITE AT ELEVATED TEMPERATURES

Werner Streit, Bobenheim; Dieter Bassing, Ludwigshafen; Karlheinz Gebert, Heddesheim; Friedrich Klippel, Ludwigshafen, and Norbert Leppert, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,095

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418109

Int. Cl.[4] D06L *3/06*

U.S. Cl. 8—108.1 7 Claims

1. A process for bleaching cotton or a cotton-containing fabric, which comprises bleaching said cotton or cotton-containing fabric with an alkali metal hypochlorite or a hypochlorite donor selected from the group consisting of dichloro- and trichloroisocyanurates in an aqueous alkaline liquor at a temperature in the range of 80°–110° C. in a course of from 30 seconds to 25 minutes in the presence of a water-soluble compound selected from the group consisting of mono-, di-, and oligosaccharides, hydroxyacetone and alpha-hydroxycarboxylic acids and derivatives thereof, as a readily oxidizable substance, in an amount of from 0.5 to 20 grams per liter, and wherein said hypochlorite or hypochlorite donor is used in such an amount that from about 1 to 8 grams of active chlorine per liter is liberated.

4,622,038

LOW RESIDUE FIBER SPIN FINISHES

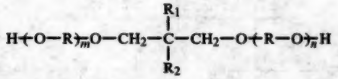
Robert B. Login, Middletown, Pa., and Michael J. Anchor, Canton Township, Wayne County, Mich., assignors to BASF Corporation, Wyandotte, Mich.

Filed Jan. 28, 1985, Ser. No. 695,308

Int. Cl.[4] D06M *15/19*

U.S. Cl. 8—115.6 18 Claims

1. In a process for finishing synthetic fiber or yarn involving the application to the surface of said fiber or yarn of a fiber finishing composition containing antistats, emulsifiers, surfactants, and one or more fiber lubricants, the improvement comprising adding to the fiber finish composition, a friction-modifying lubricant having the formula:



wherein R is the alkylene portion of a 2 to 4 carbon oxyalkylene residue, m and n are integers such that the average value of the sum (m+n) is less than about 30, and R_1 and R_2 are individually selected from the group consisting of alkyl radicals having from 1 to 8 carbon atoms.

4,622,039

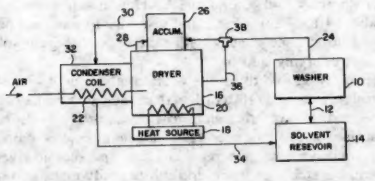
METHOD AND APPARATUS FOR THE RECOVERY AND REUSE OF SOLVENTS IN DRY CLEANING SYSTEMS

Rosario Merenda, 22 Edgemere Dr., Albertson, N.Y. 11507

Filed Mar. 15, 1985, Ser. No. 712,269

Int. Cl.[4] B08B *7/04*

U.S. Cl. 8—142 5 Claims



1. A method comprising recovering and recycling a dry cleaning solvent in a system having a dry cleaner washer unit employing a low-boiling point solvent and a hot air dryer unit comprising the steps of directing the effluent solvent vapor from said washer unit to an accumulator wherein said solvent vapor is held, directing the effluent hot air from said dryer unit to said accumulator to pass in direct contact with the solvent vapor held within said accumulator to heat at least a portion of said vapors, directing said heated vapor portion to a condenser through which an external ambient air stream is fed to said dryer, said condenser simultaneously condensing said heater solvent vapor portion into a liquid and preheating said ambient air fed to said dryer, and recycling said condensed solvent to said washer unit for reuse.

4,622,040

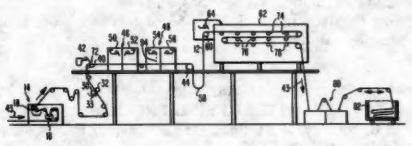
TEXTILE DYEING PROCESS

David B. Nichols, Jr., Dalton, Ga., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 19, 1978, Ser. No. 916,889

Int. Cl.[4] D06P *5/00*

U.S. Cl. 8—478 10 Claims



1. A tufted nylon textile material dyeing process comprising:

wetting the textile material with an aqueous pre-wet solution, having a viscosity of 50–120 cps and a pH of about 4

squeezing a portion of the pre-wet solution from the textile material,

printing a pattern on the textile face with a first aqueous acid dye solution at a first viscosity in the range of 50–1800 CPS,

applying a layer of a colorless aqueous gum solution to the face of the textile material, said layer having a second viscosity in the range of 600–5000 CPS, and in a ratio of about 9:1 to the viscosity of the first aqueous acid dye solution

transporting the coated wet textile material,

applying drops of a second aqueous acid dye solution to the printed and coated wet face of the textile material during said transporting said dye drops having a third viscosity in the range of about $\frac{1}{4}$ to $\frac{3}{4}$ the viscosity of the gum solution,

wet face during said transporting, said dye solution layer having a fourth viscosity of about 10% or less the viscosity of the drops of dye solution so as to be substantially masked by those portions of the textile material receiving said layer of gum solution and second dye solution, and

steaming said textile material to fix the dyes of said dye solution to said textile material and reduce the viscosity of said gum solutions.

4,622,041

TEXTILE DYEING PROCESS

David B. Nichols, Jr., Dalton, Ga., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 19, 1978, Ser. No. 916,893

Int. Cl.[4] D06P *5/00*

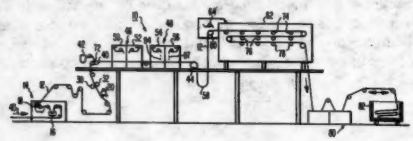
U.S. Cl. 8—478 8 Claims

1. A nylon tufted textile material dyeing process:

applying a sheet of a first colorless aqueous gum solution at a first viscosity in the range of 600–5000 CPS over the entire surface of the textile material, said gum solution being miscible with and chemically inert with first and second aqueous acid dye solutions,

applying a second colorless aqueous gum solution at a second viscosity of about ⅛ to ⅜ the viscosity of the first solution to a first portion of said surface coated with said applied sheet, said second solution being miscible with and chemically inert with said first solution and said first and second dye solutions,

applying said first acid dye solution at a third viscosity of



about ⅛ to ⅜ the viscosity of the first gum solution to a second portion of said coated surface,

applying said second acid dye solution at a fourth viscosity of about 1/10 or less the third viscosity to a third portion of the coated surface greater in area than and including said first and second portions, and

fixing the dyes of said first and second dye solutions to said textile material.

4,622,042

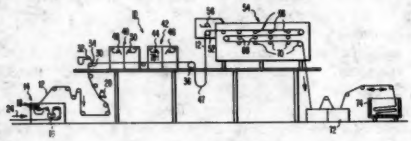
TEXTILE DYEING PROCESS

David B. Nichols, Jr., Dalton, Ga., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 19, 1978, Ser. No. 916,901

Int. Cl.[4] D06P *5/00*

U.S. Cl. 8—478 **15 Claims**



1. A tufted nylon textile material dyeing process comprising:

applying a sheet of a first aqueous acid dye solution at a first viscosity in the range of 600 to 5000 CPS to a surface of said textile material;

applying a second aqueous acid dye solution at a second viscosity in the range of ⅛ to ⅜ the viscosity of the first dye solution to a first portion of said surface;

applying a third aqueous acid dye solution at a third viscosity in the range of about 1/10 or less the second viscosity to a second portion of the textile material greater in area than and including said first portion, said first and second dye solutions effectively masking the textile material coated therewith from said third dye solution; and

fixing the dyes of said dye solutions to said textile material.

4,622,043

TEXTILE DYEING PROCESS: MULTICOLOR PATTERN DYEING OF TUFTED NYLON CARPET

David B. Nichols, Jr., Dalton, Ga., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 19, 1978, Ser. No. 916,903

Int. Cl.[4] D06P *5/00*

U.S. Cl. 8—485 **12 Claims**

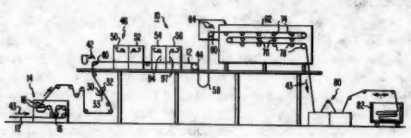
1. A continuous dyeing process for a tufted nylon textile material comprising:

first, applying a sheet of a first colorless aqueous gum solution at a first viscosity in the range of about 600–5000 CPS over the entire surface of the textile material;

second, applying a first aqueous acid dye solution at a second viscosity having a value of about one-third to two-thirds the value of the first viscosity to a first portion of said coated surface;

third, applying a second colorless aqueous gum solution at a third viscosity having a value of about one-third to two-thirds the value of the first viscosity to a second portion of said surface coated with said applied sheet;

fourth, applying a second aqueous acid dye solution at a fourth viscosity to a third portion of the textile material greater in area than and including said first and second



portions, said second dye solution having a viscosity of roughly one-tenth or less than said second and third viscosities, so that the colors of said first and second dye solutions are separately visible on said textile material, said gum solutions and first dye solution effectively masking the textile material coated therewith from said second dye solution; and

fifth, fixing the dyes of said first and second dye solutions to said textile material.

4,622,044

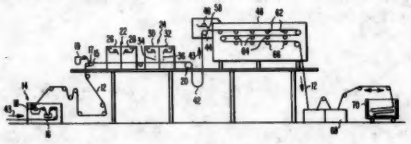
TEXTILE DYEING PROCESS FOR MULTICOLOR NYLON CARPET

David B. Nichols, Jr., Dalton, Ga., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 916,900, Jun. 19, 1978, abandoned. This application Jul. 22, 1985, Ser. No. 757,371

Int. Cl.[4] D06P *5/00*

U.S. Cl. 8—485 **9 Claims**



1. A tufted nylon textile dyeing process comprising:

applying a sheet of a colorless viscous aqueous vegetable gum solution at a pH of about 5.5–6 and at a first viscosity in a range of about 600–5000 CPS over the entire surface of the textile, said vegetable gum solution being miscible with and chemically inert with first, second, and third aqeous solutions of water soluble acid dyes of first, second, and third respective colors, the first and second dyes each at a pH of about 3 and the third dye at a pH of about 5,

then applying said first dye which is at a second visosity of about ⅛ the value of the first viscosity to a first portion of said surface coated with said vegetable gum solution,

then applying said second dye which is at a third viscosity of about ⅛ the value of the first viscosity to a second portion of said surface coated with said vegetable gum solution after applying said first dye,

then applying said third dye which is at a fourth viscosity of roughly about 1/10th or less than the value of the first and second acid dye viscosities to a third portion of the coated surface greater in area than and including said first and second portions, wherein said first and second dyes and said vegetable gum solution substantially mask said textile where coated from said third dye and said dyes penetrate said liquid prior to being fixed, and

fixing said dyes to said textile material.

4,622,045

METHOD OF DYEING WOOL WITH ACID DYESTUFFS

Josef Frauenknecht, Therwil, and Karl Zeller, Ettingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Sep. 28, 1984, Ser. No. 655,843

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335342; Aug. 17, 1984, 3430220

Int. Cl.[4] D06P *1/39, 3/16*

U.S. Cl. 8—531 25 Claims

1. A process for dyeing a textile substrate comprising wool fibers, which process comprises bringing the substrate into contact with an aqueous dyebath containing a monosulfonated acid dyestuff or a mixture of monosulfonated acid dyestuffs, said dyestuff or mixture having

(a) a build up power such that it exhausts onto wool to an extent of 90 to 98% in 60 minutes from a dyebath having a temperature of 98±1° C., a pH of 4.5, a goods: liquor ratio of 1:40 and a dyestuff concentration as required for a 2/1 standard dyeing depth, and

(b) a migrating ability such that it is capable of migrating to an extent of 25 to 40% in 60 minutes from a wool sample dyed in a 1/1 standard dyeing depth to an initially undyed wool sample of equal weight in a bath having a temperature of 98±1° C., a pH of 4.5 and a goods:liquor ratio of 1:40, said 25 to 40% being the ratio after said 60 minutes, of the amount of dyestuff on the initially undyed sample to the amount of dyestuff remaining on the dyed sample, and a leveling agent which is an alkoxylation product of an amine substituted by a C_{12-30} alkyl or alkenyl group or by a C_{13-31} alkylcarbonyl or alkenylcarbonyl group, provided that when the substrate is a wool/synthetic polyamide fiber blend the aqueous dyebath contains a mixture of monosulfonated acid dyestuffs.

4,622,046

STABILIZED HIGH SOLIDS, COAL-OIL MIXTURES AND METHODS FOR THE PRODUCTION THEREOF

Joseph D'Intino, Parkside; Carl E. Eckman, Springfield, and Lester E. Burgess, Swarthmore, all of Pa., assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 431,585

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 15 Claims

1. A method for forming a stabilized, high solids content, coal-oil mixture, said method comprising the steps of:

(i) admixing a saturated or unsaturated fatty acid with oil and heating the admixture to an elevated temperature;

(ii) admixing at least about 75% of the total coal content to be employed with the mixture resulting from step (i);

(iii) adding a gel forming amount of a base selected from the group consisting of an alkali metal hydroxide, an alkaline earth hydroxide, ammonium hydroxide, an amine and mixtures thereof to the mixture resulting from step (ii); and

(iv) admixing the remainder of the coal content with the mixture resulting from step (iii) and heating the resultant admixture to an elevated temperature thereby forming a stabilized, high solids content coal-oil mixture.

4,622,047

HOMOGENEOUS AND STABLE COMPOSITION OF ASPHALTENIC LIQUID HYDROCARBONS AND ADDITIVE USEFUL AS INDUSTRIAL FUEL

Christian Bernasconi, Charly par Vernaison; Alain Faure, Saint Chamond, and Bernard Thibonnet, Crecy La Chapelle, all of France, assignors to Elf France, Paris, France

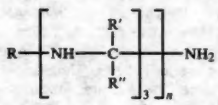
Filed Jan. 6, 1986, Ser. No. 816,566

Claims priority, application France, Jan. 17, 1985, 85 00662

Int. Cl.[4] C10L *1/18*

U.S. Cl. 44—62 15 Claims

1. A homogeneous and stable composition of asphaltenic liquid hydrocarbons useful as an industrial fuel, said composition comprised of a major quantity of said hydrocarbons and a minor quantity of at least one stabilizing additive for preventing the flocculation of asphaltenes, said additive selected from the group consisting of constituent A resulting from the condensation of at least one cyclic anhydride and at least one linear N-alkylpolyamine corresponding to the general formula:



(I)

wherein n is an integer at least 1, R is a saturated or unsaturated hydrocarbon radical of C_{10} to C_{22}, R′ and R″, are identical or different, and are selected from hydrogen and monovalent hydrocarbon radicals of C_1 to C_3, and constituent B resulting from the reaction of an ethoxylated amine with at least one carboxylic acid of C_8 to C_{30}.

4,622,048

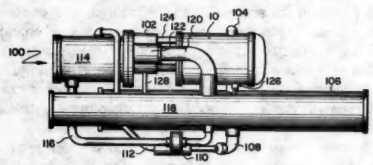
LIQUID-GAS SEPARATOR

John H. Roberts, La Crosse, Wis., and James C. Tischer, La Crescent, Minn., assignors to American Standard Inc., New York, N.Y.

Filed Jan. 17, 1985, Ser. No. 692,096

Int. Cl.[4] B01D *53/24*

U.S. Cl. 55—199 4 Claims



1. Apparatus for separating oil from the mixture of oil and compressed refrigerant gas discharged by an oil-injected compressor in a refrigeration circuit comprising:

sealed housing means having a discharge opening and defining an oil sump, said housing means for receiving a mixture of compressed gas into which oil has been injected;

a cylindrical, permeable separator shell having an inlet end and an outlet end, said shell being mounted interior of said sealed housing means so that said mixture of oil and gas received by said sealed housing means is communicated directly into the inlet end of said shell and said shell being mounted at a height above said oil sump which precludes contact of said shell with oil in said sump, the permeability of said shell being selected to maintain a predetermined pressure differential between the interior of said shell and the interior of said sealed housing means to facilitate the driving of oil through said permeable shell;

means, disposed interior of said shell and including a column coaxial with said shell, for defining a single uninterrupted helical passage having a single helical orientation interior of said separator shell between said inlet end and said outlet end, said column extending less than the entire length of said shell and cooperating with said shell to define an unobstructed discharge area at said outlet end of said shell, said discharge area being in flow communication with said discharge opening of said sealed housing means, whereby in operation a mixture entering said shell is imparted a swirling motion in a single helical direction so that the gas in the mixture travels through said shell in

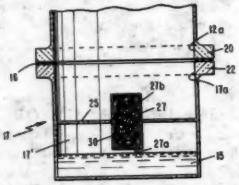
a single swirl and in a single flow direction to minimize the pressure drop in the gas while sufficient centrifugal force is imparted the oil to cause the migration of oil droplets of a size greter than a predetermined size radially outward to and through the permeable wall of said shell within the length of said shell.

4,622,049

APPARATUS FOR ADJUSTING AND MAINTAINING THE HUMIDITY OF GAS AT A CONSTANT VALUE WITHIN A CLOSED SYSTEM

Bethel R. Abernathy, Franklin, and Ronald R. Walters, Germantown, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 5, 1985, Ser. No. 762,369
Int. Cl.[4] G01N *17/00*
U.S. Cl. 55—250 10 Claims



1. A device for maintaining and controlling the humidity of a gas within a sealed environment, comprising container means having a partition for separating the interior of said container means into upper and lower chambers, said lower chamber containing an aqueous saturated salt solution containing crystals of said salt, a tube extending through the partition plate to provide communication between said upper and lower chambers and to enable gas humidified by the salt solution within the lower chamber to pass into the upper chamber; and further including means for preventing salt from said salt solution from migrating to the upper chamber from the lower chamber, said salt migration preventing means being located within said tube.

4,622,050

AIR INLET FILTER FOR GAS TURBINE ENGINE

William O'Connor, Westport, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Jul. 22, 1985, Ser. No. 757,332
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—283 11 Claims

1. An air inlet filter assembly for filtering debris from air for a gas turbine engine, said gas turbine engine having an inlet end for receiving the filtered air, said air inlet filter assembly comprising:

a plenum box fixedly mounted to and surrounding the inlet end of the engine, said plenum box including an inlet for receiving debris laden air;

an annular air filter rotationally mounted within said plenum box intermediate the inlet of the plenum box and the inlet end of the engine, said annular air filter being operative to filter debris from air passed therethrough;

an air pressure nozzle fixedly mounted in said plenum box and adjacent the inner circumferential surface of said annular air filter, said air pressure nozzle being selectively operable to direct pressurized air generally radially outwardly and through said annular air filter to loosen debris thereon;

a suction nozzle fixedly mounted within said plenum box and adjacent the outer circumferential surface of said annular air filter and generally radially opposite the air pressure nozzle, said suction nozzle being selectively operable to remove the loosened debris from the annular air filter;

driving means for selectively rotating said annular air filter about its central axis and relative to the plenum box, the air pressure nozzle and the suction nozzle such that the entire annular air filter passes between the air pressure and suction nozzles with each rotation, whereby simultaneous operation of said air pressure nozzle, said suction nozzle and said driving means enables the entire annular air filter to be cleaned with each rotation of said annular air filter;

at least one flexible seal mounted intermediate said air filter and said plenum box, said flexible seal being operative to prevent debris from bypassing the air filter and entering the engine, is generally annular in configuration and is biased in radially inward direction to prevent the inward movement of debris toward the turbine engine and is fixedly mounted to the plenum box and is biased against the annular air filter; and

an array of seal air pressure nozzles disposed generally adjacent and radially inwardly from said flexible seal, said array of seal air pressure nozzles being selectively operable to direct air radially outward against said flexible seal to facilitate rotation of said air filter and to prevent movement of debris past the seal.

4,622,051

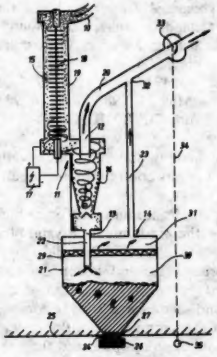
ARRANGEMENT FOR REMOVING SOOT PARTICLES AND OTHER SOLID PARTICLES FROM EXHAUST GAS OF POWER VEHICLES

Wilhelm Polach, Möglingen, and Klaus-Dieter Zimmermann, Vaihingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 807,439
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502448
Int. Cl.[4] B01D *45/00*
U.S. Cl. 55—417 12 Claims

1. An arrangement for removing soot particles and other solid particles from exhaust gas of power vehicles, comprising a soot deflector cyclone arranged to receive exhaust gas and having a first outlet for a cleaned exhaust gas stream and a second outlet for a soot-containing exhaust gas stream; and a soot collector connected with said second outlet and arranged for removing soot, said soot collector being formed as an exhaust gas-impermeable collecting container fixedly mountable in a power vehicle, said collecting container having a soot removing pipe arranged to extend through a vehicle wall outwardly and having a closeable and openable end, said collecting container also having a filter-covered exhaust gas outlet

pipe, said soot collector having a removable closing cover arranged to to close and to open said one end of said soot



removing pipe, and a filter which covers said exhaust gas outlet pipe.

4,622,052

STRATIFIED BULK MATERIAL FILTER

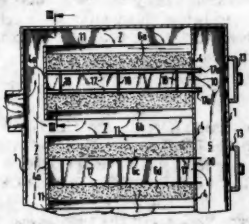
Adolf Margraf, Am Schleplingsbach 46, 3060 Stadthagen, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,265

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434310

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—479 **8 Claims**



1. A stratified bulk material filter comprising a housing having an inlet for admitting contaminated gases containing dust and smoke and an outlet for exiting purified gases, said housing having an interior filled with granular material, including a bottom collector-space within the said housing, a separation wall sub-dividing said housing into a contaminated gas space comprising at least one pair of upright granular material layers, the layers separated by spaced gas permeable lateral delimitation means and arranged to be traversed by a flow of the contaminated gas, and a purified gas space which is in communication via an opening in the separation wall with a flow escape space between the two spaced granular material layers of the pair, in which the gas-permeable lateral delimitation means of each granular material layer at the flow arrival and flow departure sides consist of replaceable rigid gas-permeable delimiting members supported between the separation wall and an opposite terminal wall of each granular layer, and opening means on a wall of said housing, adjacent said purified gas space, for admitting the insertion of said members in said flow escape space, of each pair of the granular material layers, bearer means for suspending said members at least at their extremities on the separation wall and said opposite terminal wall.

4,622,053

SEPARATION OF HYDROCARBON MIXTURES

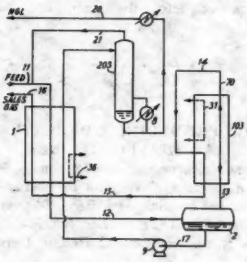
Terence R. Tomlinson, Stockport, United Kingdom, and Donald R. Cummings, Burradoo Nr. Bowral, Australia, assignors to Petrocarbon Developments Limited, Manchester, United Kingdom

Continuation-in-part of Ser. No. 553,640, Nov. 21, 1983, abandoned. This application Sep. 14, 1984, Ser. No. 650,724

Claims priority, application United Kingdom, Sep. 20, 1983, 8325069; Jul. 31, 1984, 8419488

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—26 **16 Claims**



1. In a process for the separation of a light gas which contains methane and/or hydrogen, and which forms a major part (by volume) of the feed gas mixture, from a heavier stream containing C_3 hydrocarbon, optionally together with C_2 hydrocarbon and/or hydrocarbon containing 4 or more carbon atoms, which process comprises:

(i) cooling the feed gas mixture at superatmospheric pressure to partially condense it,

(ii) separating the condensate from the uncondensed gas,

(iii) rectifying the uncondensed gas to produce said light gas, and

(iv) stripping the condensate to produce said heaver portion,

the improvement by which the light gas is obtained at a pressure close to that of the feed gas, comprising:

effecting said rectification of said uncondensed gas in step (iii) by passing uncondensed gas upwards, at substantially the same pressure as that at which it is obtained from step (ii), while further cooling the uncondensed gas to partially condense it, whereby the liquid condensed out of said gas flows downwards in counter-current fashion in contact with the rising gas and forms a mixture with condensate formed by the partial condensation;

prior to said stripping step (iv), warming said condensate by indirect heat exchange with the feed gas mixture; and

effecting said step (iv) by stripping of said condensate in a stripping column to produce said heavier portion.

4,622,054

METHOD AND APPARATUS FOR MAKING NON-CIRCULAR MINERAL FIBERS

Larry J. Huey, and Paul D. Beuther, both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

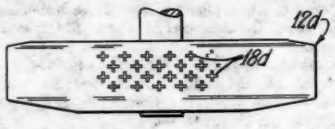
Continuation-in-part of Ser. No. 677,666, Dec. 3, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,673

Int. Cl.[4] C03B *37/022*

U.S. Cl. 65—2 **9 Claims**

1. The method of making mineral fibers having a mod ratio greater than about 1.2 comprising rotating a spinner containing molten mineral material having a liquidus greater than about 1200° F. (649° C.), said spinner having non-circular orifices positioned in its peripheral wall, to centrifuge said molten mineral material through said orifices as molten streams having non-circular cross-sections, the mineral material in said streams having a low enough initial viscosity that said streams would

assume circular cross-sections in the absence of quenching, and quenching the centrifuged streams to harden them into mineral



fibers having a non-circular cross-sectional shape similar to the shape of said orifices before the streams can assume a circular cross-section.

4,622,055

METHOD FOR PRODUCING A BARE FIBER TAPER AT A METALLIZED FIBER

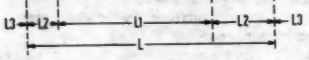
Konrad Mathyssek, Zorneding, and Jan Smola, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 19, 1985, Ser. No. 746,516

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422893

Int. Cl.[4] C03B *37/027*

U.S. Cl. 65—2 **16 Claims**



1. A method for producing a bare fiber taper at a metallized, fiber, comprising the steps of;

softening and drawing of a metallized glass optical fiber in an arc, whereby the softened, metallized fiber constricts and the metallized fiber is freed of the metallization and thus becomes bare over its entire circumference in the arising constriction as a consequence of the action of the arc, whereby, after parting, the bare constriction thus arising and a tapering, bare end section thereby arising at a metallized fiber is employable as a bare fiber taper.

4,622,056

METHOD OF PREPARING SILICA GLASS

Nobutaka Matsuo; Yoshitaka Itoh; Sadao Kanbe; Haruo Osafune, and Masanobu Motoki, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,527

Claims priority, application Japan, Feb. 13, 1985, 60-26001; Jul. 16, 1985, 60-156670; Nov. 11, 1985, 60-252301

Int. Cl.[4] C03B *19/06*

U.S. Cl. 65—18.1 **34 Claims**

1. A method for preparing silica glass articles, comprising:

preparing a first solution by hydrolyzing silicon alkoxide with a basic reagent;

preparing a second solution by hydrolyzing silicon alkoxide with an acid reagent;

mixing the first and second solutions together at a predetermined mixing ratio in order to yield a sol solution;

pouring the sol solution into a container;

gelling the sol solution to a wet gel;

drying the wet gel to a dry gel; and

sintering the dry gel to yield a silica glass article.

4,622,057

PROCESS FOR MAKING THICK-WALLED CERAMIC BODIES FROM SYNTHETIC MICAS

Kenneth Chyung; Thomas J. Dwyer, both of Painted Post; Gordon F. Foster, Campbell; Robert D. Shoup, and Roger A. Young, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 471,539, Mar. 2, 1983, abandoned. This application May 16, 1985, Ser. No. 734,917

Int. Cl.[4] C03B *19/06*

U.S. Cl. 65—18.1 **15 Claims**

1. A method of making sintered, thick-walled, crystalline ceramic bodies of various configurations which comprises the steps of:

(a) forming a synthetic lithium and/or sodium, waterswelling mica body, the predominant crystal phase of the mica being fluorhectorite, boron fluorphlogopite, solid solutions of fluorhectorite and boron fluorphlogopite, and solid solutions between fluorhectorite or boron fluorphologopite and species structurally compatible therewith selected from the group of talc, fluortalc, polylithionite, fluorpolylithionite, phlogopite, and fluorphlogopite;

(b) contacting said body with a polar liquid for a time sufficient to cause swelling and disintegration thereof accompanied with the formation of a gel;

(c) contacting said gel with a source of large cations selected from the group of K^+, Rb^+, Cs^+, Mg^{+2}, Ag^+, Cu^+, Ca^{+2}, Sr^{+2}, Ba^{+2}, Pb^{+2}, H_3O^+, and organic polycations for a time sufficient to effect an ion exchange reaction between said large cations and Li^+ and/or Na^+ ions in said gel and to cause flocculation of the gel with the formation of a slurry containing floc aggregates;

(d) substantially separating the floc from the bulk of the polar liquid;

(e) shaping the separated floc to a body of a desired geometry; and

(f) firing said shaped body at a temperature of at least about 850° C., but below about 1100° C., to eliminate hygroscopic behavior of the body and to obtain a sintered, thick-walled, crystalline ceramic body.

4,622,058

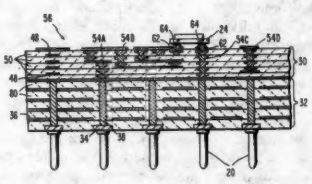
FORMATION OF A MULTI-LAYER GLASS-METALLIZED STRUCTURE FORMED ON AND INTERCONNECTED TO MULTI-LAYERED-METALLIZED CERAMIC SUBSTRATE

Pamela A. Leary-Renick, Fishkill, and Rangaswamy Srinivasan, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 623,584, Jun. 22, 1984, abandoned. This application Mar. 25, 1986, Ser. No. 844,260

Int. Cl.[4] B44C *1/22*; C03B *23/26*

U.S. Cl. 65—105 **33 Claims**



1. A method for forming vias in a structure, wherein said structure is selected from the group consisting of glass and glass-ceramics, comprising:

superimposing over said structure an inert first mask having a pattern of first apertures therethrough;

masking said structure with said first mask and employing said first apertures thereof to partially ablate vias by radi-

ating an ultraviolet laser through the top of and into said structure in the areas opposite said first apertures, with the bottom of said vias spaced a distance fom the bottom of said structure;

replacing said first mask with a second mask having a pattern of second apertures extending therethrough, said pattern of second apertures corresponding to said pattern of said first mask with said second pattern of apertures being substantially smaller than and concentric with said first apertures; and

employing said second apertures to completely ablate through said structure by radiating an ultraviolet laser upon areas opposite said second apertures to form vias having stepped-shoulder counter-bored configurations.

8. A method for forming vias in a a multi-component glass structure consisting of:

defining a pattern of desired via locations on one surface of said structure;

ablating vias by directing ultraviolet radiation from an ultraviolet laser onto said pattern of desired via locations;

said vias being ablatively photodecomposed through the top of said structure to a predetermined depth.

4,622,059

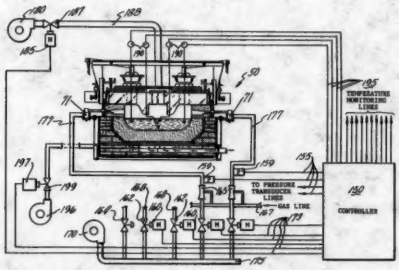
APPARATUS FOR CONTROLLING TEMPERATURE WITHIN A FOREHEARTH

George W. Brown, Windsor, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 8, 1985, Ser. No. 785,424

Int. Cl.[4] C03B 5/24

U.S. Cl. 65—160 **13 Claims**



1. An improved electronic control system for controlling the temperature of a glass forehearth, said forehearth including an elongated refractory channel subdivided into a plurality of zones, wherein at least some of said zones each include (a) at least one variable output heater for locally heating molten glass flowing along the refractory channel, and (b) at least one temperature sensor, each associated with a given variable output heater for sensing local glass temperature and providing an output signal representative of the sensed temperature; said control system further including (c) temperature comparison means for processing the output signals of said temperature sensors to compare these with set point signals and for providing a heater adjustment signal based upon such comparison, (d) for each of the variable output heaters, a heater adjusting means operatively connected to said variable output heater for adjusting the heat output of said heater in response to a corresponding heater adjustment signal, and (e) means for transmitting the set point signals and the temperature sensor output signals to the temperature comparison means, and the heater adjustment signals from the temperature comparison means to each of the heater adjusting means,

wherein the improvement comprises a time-division multiplexing apparatus for said control system comprising:

timing means for establishing a control cycle and a plurality of operating time segments within said control cycle, wherein at least some of said operating time segments ("control loop segments") are each identified with a respective temperature sensor, set point signal, and heater adjusting means; and

multiplexing means for switching the operation of the transmitting means to route the respective temperature sensor output and set point signal to the temperature comparison means, and to route the resulting heater adjustment signal to the respective heater adjusting means, during each of the control loop segments of each control cycle.

4,622,060

HERBICIDAL COMPOSITIONS AND HERBICIDAL PROCESSES

Tetsuo Takematsu; Makoto Konnai, both of Utsunomiya; Kunitaka Tachibana, Yokohama; Takashi Tsuruoka, Kawasaki; Shigeharu Inouye, and Tetsuro Watanabe, both of Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 495,819, May 18, 1983, Pat. No. 4,552,584, which is a division of Ser. No. 164,510, Jul. 2, 1980, abandoned, which is a division of Ser. No. 959,838, Nov. 13, 1978, Pat. No. 4,309,208. This application Apr. 1, 1985, Ser. No. 718,341

Claims priority, application Japan, Mar. 9, 1978, 53-25971

Int. Cl.[4] A01N 47/30, 57/20

U.S. Cl. 71—86 **6 Claims**

1. A process for severely damaging or killing unwanted herbaceous and bushy plants, which comprises applying to unwanted herbaceous plants or the growth medium of said plants a composition consisting essentially of (A) SF-1293 substance or a salt thereof selected from the group consisting of sodium, potassium, lithium and ammonium salts thereof and (B) N-(3,4-dichlorophenyl)-N'-methoxy-N'-methylurea, at a weight ratio of the component (A) to component (B) in the range of 3:1 to 1:3 and at the rate of application of the component (A) in the range of 50 to 150 g per 10 ares, to inhibit the growth of said unwanted plant.

4,622,061

HERBICIDAL 2-HALOACETAMIDES

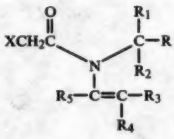
Gerhard H. Alt, University City, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 133,759, Mar. 25, 1980, abandoned. This application May 4, 1983, Ser. No. 491,477

Int. Cl.[4] A01N 37/22, 43/08; C07C 103/38; C07D 307/06

U.S. Cl. 71—88 **27 Claims**

1. Compounds having the formula



wherein X is chlorine, bromine or iodine;

R_1 and R_2 are hydrogen or C_{1-6} alkyl;

R_3 and R_4 are an R_1 member or C_{2-8} alkenyl or alkynyl radical;

R_5 is an R_3 member other than hydrogen, phenyl, benzyl, furyl, tetrahydrofuryl or said R_5 members substituted with an R_3 member, C_{1-6} alkoxy, polyalkoxy, alkoxyalkyl, alkylthio, alkylthioalkyl, nitro, cyano, halogen, trifluoromethyl or hydroxy groups; and

R is phenyl or substituted phenyl radical as defined for R_5 or furyl when R_5 is phenyl or tolyl.

4,622,062

HERBICIDAL N-[(4,6-SUBSTITUTED PYRIMIDIN-2-YL)AMINOCARBONYL]-SUBSTITUTED FUSED PYRAZOLE-3-SULFONAMIDES

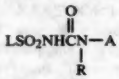
Barry A. Wexler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 578,344, Feb. 9, 1984, abandoned. This application Dec. 10, 1984, Ser. No. 678,409

Int. Cl.[4] A01N *43/48*; C07D *239/02*

U.S. Cl. 71—90 45 Claims

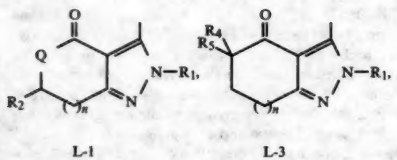
1. A compound selected from



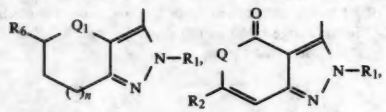
wherein

R is H or CH_3;

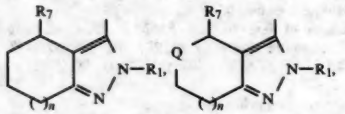
L is



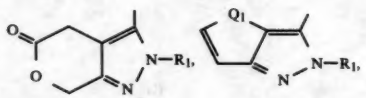
L-1 L-3



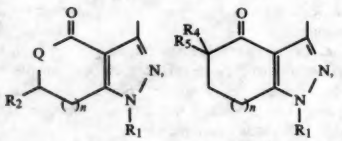
L-4 L-5



L-7 L-8



L-9 L-10



L-11 L-13

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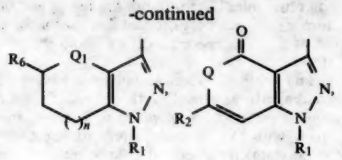
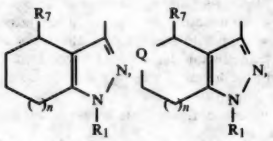
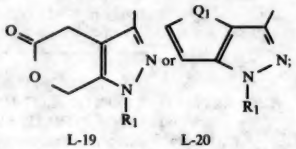


L-14 L-15



L-17 L-18



L-19 L-20

R_1 is H, C_1–C_3 alkyl, $CH_2CH{=}CH_2$, $CH_2C{\equiv}CH$, CH_2CF_3, CHF_2, phenyl, phenyl substituted with NO_2, CH_3, OCH_3, Cl, Br or F,

SO_2CH_3, $SO_2N(CH_3)_2$ or CO_2CH_3;

R_2 is H or C_1–C_3 alkyl;

R_4 is H, Cl or CH_3;

R_5 is H, Cl or CH_3;

R_6 is H or C_1–C_3 alkyl;

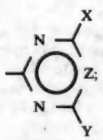
R_7 is H or CH_3;

n is 0 or 1;

Q is O, S or NCH_3;

Q_1 is O, S or SO_2;

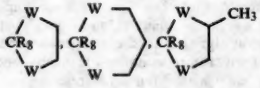
A is



A-1

X is CH_3, OCH_3, OC_2H_5, F, Cl, Br, CF_3, OCF_2H or CFH_2;

Y is H, C_1–C_3 alkyl, OCH_3, OCH_2CH_3, CH_2OCH_3, $SeCH_3$, $CH_2OCH_2CH_3$, NH_2, $NHCH_3$, $N(CH_3)_2$, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, OCH_2CF_3, $OCH_2CH_2OCH_3$, CH_2SCH_3, OCF_2H, SCF_2H, cyclopropyl, $CR_8(WCH_3)_2$,



or $CR_8(WCH_2CH_3)_2$;

(R_8 is H or CH_3;

W is O or S;

Z is CH;

provided that when X is Cl, F or Br, then Y is OCH_3, OCH_2CH_3, NH_2, $NHCH_3$, $N(CH_3)_2$ or OCF_2H; and also provided that when Y is $SeCH_3$, then X is CH_3, OCH_3, OCH_2CH_3, OCF_2H or CF_3.

31. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,622,063

4-(2-FLUORO-4-HALO-5-SUBSTITUTED PHENYL)URAZOLS, AND HERBICIDAL USE

Eiki Nagano, Nishinomiya; Shunichi Hashimoto, Toyonaka; Ryo Yoshida, Kawanishi; Hiroshi Matsumoto, Toyonaka, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

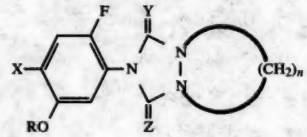
Division of Ser. No. 418,426, Sep. 15, 1982, Pat. No. 4,452,981. This application Mar. 22, 1984, Ser. No. 592,064

Claims priority, application Japan, Sep. 19, 1981, 56-148443; Feb. 19, 1982, 57-26512

Int. Cl.[4] A01N *43/653*; C07D *487/04*

U.S. Cl. 71—92 **19 Claims**

1. A condensed phenylurazol of the formula:



wherein X is a chlorine atom or a bromine atom, Y and Z are each an oxygen atom or a sulfur atom and R is a C_1–C_3 alkyl group, an allyl group or a propargyl group and n is 5.

15. A method for controlling or exterminating weeds which comprises applying a herbicidally effective amount of the condensed phenylurazol according to claim 1 to the area where the weeds grow or will grow.

4,622,064

TRIAZOLO-(3,2-C)PERHYDROXAZIN-8-ONE DERIVATIVES AND USE AS FUNGICIDES AND PLANT GROWTH REGULATORS

Junichi Saito; Yoshio Kurahashi; Toshio Goto, and Naoko Yamaguchi, all of Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo K. K., Tokyo, Japan

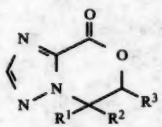
Filed Dec. 16, 1985, Ser. No. 810,104

Claims priority, application Japan, Dec. 20, 1984, 59-267443

Int. Cl.[4] A01N *43/90*; C07D *498/04*

U.S. Cl. 71—92 **10 Claims**

1. A triazolo-(3,2-c)perhydroxazin-8-one derivative of the formula:



in which

R^1 represents a hydrogen atom,

R^2 represents a hydrogen atom, a phenoxy group substituted by a halogen atom or a phenyl group, or a benzyl group substituted by a halogen atom, or R^1, together with R^2, may form a halogen-substituted benzylidene group or a cyclohexyl-methylidene group, and

R^3 represents a tert-butyl group or a phenyl group substituted by a halogen atom.

7. A method of regulating the growth of plants which comprises applying to such plants or to a plot in which said plants are grown or to be grown a plant growth-regulating effective amount of a compound according to claim 1.

9. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim 1.

4,622,065

SULFAMOYL UREA DERIVATIVES

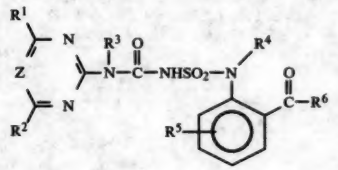
Barry Van Gemert, Massillon, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 667,513, Nov. 1, 1984, abandoned. This application Oct. 25, 1985, Ser. No. 791,269

Int. Cl.[4] C07D *251/46*, *251/42*, *251/16*; A01N *43/66*

U.S. Cl. 71—93 **5 Claims**

1. A compound represented by the formula:



wherein:

Z is N;

R^1 and R^2 are the same or different and represent halogen or C_1 to C_6 alkyl or alkoxy;

R^3 and R^4 are the same or different and represent hydrogen, C_1 to C_4 alkyl, alkoxyalkyl, haloalkyl, or up to C_3 alkenyl or alkynyl;

R^5 is hydrogen, halogen or C_1 to C_4 alkyl or haloalkyl; and

R^6 is methyl or ethyl.

5. In a method of controlling weeds wherein a herbicidally effective amount of herbicide is applied to a growth medium prior to emergence of weeds therefrom or to the weeds subsequent to their emergence from the growth medium, the improvement residing in using as the herbicide a compound or mixture of compounds defined in claim 1.

4,622,066

FLUORINE-CONTAINING BENZOPHENONE DERIVATIVES

Katsuhiko Kitahara, Kyoto; Tetsuya Masutani, Osaka; Takashi Yamaoka, Kusatsu; Tetsuo Kitahaba, Settsu; Takasi Nisioka, Sakai, and Yasuo Itami, Higashi-Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

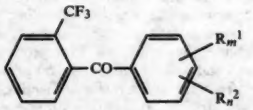
Filed Jan. 10, 1984, Ser. No. 569,734

Claims priority, application Japan, Jan. 12, 1983, 58-4010

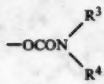
Int. Cl.[4] A01N *31/00*; C07C *69/76*, *49/76*

U.S. Cl. 71—98 **14 Claims**

1. A fluorine-containing benzophenone derivative of the formula:



wherein R^1 is a group of the formula: —OM (in which M is hydrogen or alkali metal), lower acyloxy, a group of the formula:



(in which R^3 and R^4 are same or different and hydrogen or lower alkyl) or a group of the formula: $—OCH_2COOR^5$ (in which R^5 is hydrogen, lower alkyl or alkali metal); R^2 is a lower alkyl group, halogen, nitro, chlorosulfonyl, sulfo, trifluoromethyl or a group of the formula: $—SCF_2H$; and m and n are each an integer of 1 to 4 provided that the sum of m and n is not more than 5.

4,622,067

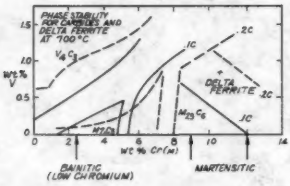
LOW ACTIVATION FERRITIC ALLOYS

David S. Gelles, West Richland, Wash.; Nasr M. Ghoniem, Granada Hills, Calif., and Roger W. Powell, Pasco, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 7, 1985, Ser. No. 699,092

Int. Cl.[4] C22C *38/24, 38/22*

U.S. Cl. 420—61 **9 Claims**



1. A ferritic alloy having a banitic or martensitic microstructure when heated treated and tempered and characterized by low activation properties, said alloy consisting essentially of:

chromium—2.0 to 13 percent by weight;

vanadium or, tungsten, or tantalum in a total amount of—0.3 to 1.5 percent by weight;

carbon—0.075 to 0.30 percent by weight;

manganese—0.01 to 15.0 percent by weight;

silicon—0.05 to 1.0 percent by weight;

phosphorous—less than 0.01 percent by weight;

nitrogen—less than 0.04 percent by weight;

sulphur—less than 0.01 percent by weight;

copper—less than 0.003 percent by weight;

molybdenum—less than 0.12 percent by weight;

niobium—less than 0.003 percent by weight;

nickel—less than 0.1 percent by weight;

the remainder of the alloy being iron.

4,622,068

SINTERED MOLYBDENUM ALLOY PROCESS

Charles E. D. Rowe, Billericay, and George R. Hinch, Stanford-le-Hope, both of England, assignors to Murex Limited, Essex, England

Filed Nov. 12, 1985, Ser. No. 797,294

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1986, 3441851

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—245 **15 Claims**

1. A process for the preparation of a sintered molybdenum alloy which comprises the steps of blending molybdenum and/or a molybdenum oxide with a solution of a salt of a metal which solution under the conditions of the process gives rise to and oxide of the metal without further decompostion or permanent alteration from the solid phase subjecting the mixture, after, if necessary, drying, crushing, and screening,to a reducing hydrogen atmosphere at a temperature not greater than 1150° C., further processing to form a shaped article by techniques known for processing powdered molybdenum, and sintering under a hydrogen atmosphere at a temperature in the range of from 1750° C. to 2200° C., without the addition of carbon or a carbon-containing compound at any stage in the process.

4,622,069

CATALYST COMPOSITION FOR FORMING ELECTROLESS PLATING ON CERAMICS

Yoshito Akai, Naga; Nobuyuki Konaga, Osaka; Yasunori Arisato, Katano; Masatoshi Wada, Kishiwada, and Yukikazu Moritsu, Nishinomiya, all of Japan, assignors to Okuno Chemical Industry Co., Ltd., Osaka, Japan

PCT No. PCT/JP85/00128, § 371 Date Nov. 15, 1985, § 102(e) Date Nov. 15, 1985

PCT Filed Mar. 14, 1985, Ser. No. 803,290

Claims priority, application Japan, Mar. 16, 1984, 59-51353

Int. Cl.[4] C23C *3/02*

U.S. Cl. 106—1.11 **12 Claims**

1. A catalyst composition for forming electroless plating on ceramics which comprises:

(i) 1 weight part of at least one member selected from the group consisting of

(a) organic palladium compounds of the general formulas:

$(C_nH_{2n+1}COO)_2Pd[(C_{n'}H_{2n'+1})_2NH]_2$,

$(C_nH_{2n+1}COO)_2Pd[(C_{n'}H_{2n'+1})_3N_2$,

$(C_nH_{2n+1}COO)_2Pd[(C_{n'}H_{2n'+1})NH(C_6H_5)]_2$,

$(C_nH_{2n+1}COO)_2Pd[(C_6H_5)_2NH]_2$ and

$(C_nH_{2n+1}COO)_2Pd(C_5H_5N)_2$

wherein n and n', respectively are an integer of 1 to 7 and

(b) organic silver compounds of the general formulas:

$(C_nH_{2n+1}COO)Ag[(C_{n'}H_{2n'+1})_2NH]$,

$(C_nH_{2n+1}COO)Ag[(C_{n'}H_{2n'+1})_3N]$,

$(C_nH_{2n+1}COO)Ag[(C_{n'}H_{2n'+1})NH(C_6H_5)]$,

$(C_nH_{2n+1}COO)Ag[(C_6H_5)_2NH]$ and

$(C_nH_{2n+1}COO)Ag(C_5H_5N)$

wherein n and n', respectively, are an integer of 1 to 7,

(ii) 0.1 to 200 weight parts of at least one member selected from the group consisting of organic metal compounds of the general formulas:

$(C_nH_{2n+1}COO)_2M$,

$(C_nH_{2n+1}COO)_2M[(C_{n'}H_{2n'+1})_2NH]_2$,

$(C_nH_{2n+1}COO)_2M[(C_{n'}H_{2n'+1})_3N]_2$,

$(C_nH_{2n+1}COO)_2M[(C_{n'}H_{2n'+1})NH(C_6H_5)]_2$,

$(C_nH_{2n+1}COO)_2M[(C_6H_5)_2NH]_2$,

$(C_nH_{2n+1}COO)_2M(C_5H_5N)_2$,

$(C_nH_{2n+1}COO)_3Al$,

$(C_{n''}H_{2n''+1}O)_3Al$ and

$C_6H_9O_3Al(OC_{n''}H_{2n''+1})_2$

wherein n is equal to 0 or an integer of 1 to 18, n' is an integer of 1 to 18, n'' is an integer of 2 to 4, and M denotes copper, nickel, iron, aluminum, zinc or tin and

(iii) 10 to 1000 weight parts of an organic solvent.

4,622,070

FIBROUS COMPOSITE MATERIAL FOR FUSED ALUMINUM

Seiji Sakurai, Kanagawa, and Kaoru Umino, Tokyo, both of Japan, assignors to Nichias Corporation, Tokyo, Japan

Filed Nov. 14, 1984, Ser. No. 671,304
Claims priority, application Japan, Nov. 16, 1983, 58-214078
Int. Cl.[4] B28B 7/36
U.S. Cl. 106—38.22 9 Claims

1. A fibrous composite material for use primarily in contact with fused aluminum or aluminum alloys consisting essentially of:

1 part by weight of alumino silicate-based ceramic fibers,

from 0.3 to 5 parts by weight of at least one micaceous mineral selected from the group consisting of muscovite, phlogopite, biotite, and sericite,

up to 5 parts by weight of refractory powder particles per part by weight of the ceramic fibers, an inorganic binder, a dispersant, a plasticizer, and

water, wherein said inorganic binder is a colloidal binder selected from the group consisting of silica, alumina and zirconia.

4,622,071

PROCESS FOR PRODUCING A HARDENED PRODUCT OF COAL ASH

Sadaji Matsuura; Satoru Ando, and Masamitsu Kiso, all of Fuji, Japan, assignors to Fuji Fire-Proof Material Industry Co., Ltd., Shizuoka, Japan

Filed Sep. 28, 1984, Ser. No. 655,590
Claims priority, application Japan, Oct. 7, 1983, 58-188031
Int. Cl.[4] C04B 7/02
U.S. Cl. 106—97 19 Claims

1. A process for producing a hardened fire-resistant board product of coal ash, which comprises:

reacting at least one acid selected from the group consisting of sulfuric acid, and hydrochloric acid with coal ash to obtain a first reaction mixture;

reacting calcium carbonate with first reaction mixture to obtain a second reaction mixture;

mixing the second reaction mixture with water and at least one hydraulic material selected from the group consisting of cement, slag, gypsum, slaked lime and quick lime to obtain a third reaction mixture; and

shaping and curing the third reaction mixture to obtain the hardened fire-resistant board product of coal ash.

4,622,072

SURFACE COATING COMPOSITIONS

John H. W. Turner, Stockport, England, assignor to Alcan International Limited, Quebec, Canada

Filed Dec. 18, 1984, Ser. No. 683,313
Claims priority, application United Kingdom, Dec. 22, 1983, 8334267
Int. Cl.[4] C08L 91/00; C08K 5/00
U.S. Cl. 106—252 10 Claims

1. A coating composition comprising

(i) a paint medium which may be pigmented or unpigmented and which includes a drying or semi-drying oil, an oil-soluble resin, an oil-modified alkyd resin, or mixtures thereof,;

(ii) at least one aluminum compound which is an aluminum alkoxide or a compound derived from an aluminum alkoxide by an addition, substitution or condensation reaction;

(iii) a primary stabilizer comprising at least one volatile base selected from ammonia, aqueous ammonia, an alkylamine, a cycloalkylamine, an arylamine, an alkanolamine and compounds thereof which by dissociation or hydrolysis release ammonia or an amine; and

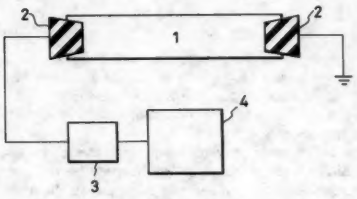
(iv) an additional stabilizer comprising added water in an amount not greater than one mole of water for each alkoxide group present in the aluminum alkoxide compound or in the aluminum alkoxide from which the aluminum compound is derived.

4,622,073

METAL POWDER PIGMENT

Yoshiki Hashizume, Kashiwara, Japan, assignor to Toyo Aluminium Kabushiki Kaisha, Osaka, Japan

Filed Nov. 30, 1984, Ser. No. 677,016
Claims priority, application Japan, Dec. 6, 1983, 58-230199; Nov. 2, 1984, 59-232086; Nov. 2, 1984, 59-232087
Int. Cl.[4] C04B 14/34
U.S. Cl. 106—290 22 Claims



1. A metal powder pigment, which comprises a plurality of metal particles, each of which has coated thereon an electrically insulating surface coating formed by contacting said metal particles with an organic titanate of the formula:

$$Ti(OR)_2[OC_2H_4N(C_2H_4OH)_2]_2$$

where R is an alkyl group having 1 to 8 carbon atoms, said contacting resulting in binding of said titanate to said metal particles followed by hydrolyzing said titanate onto the surfaces of said metal particles.

4,622,074

PIGMENTS AND EXTENDER PIGMENTS WHICH ARE SURFACE-TREATED WITH HYDROGENATED LECITHIN, AND COSMETICS CONTAINING THE SAME

Ryota Miyoshi, Yono, and Isao Imai, Kuki, both of Japan, assignors to Miyoshi Kasei Co., Ltd., Saitama, Japan

Filed May 2, 1985, Ser. No. 729,730
Int. Cl.[4] C08J 7/00
U.S. Cl. 106—308 F 5 Claims

1. A pigment or extender pigment the surfaces of which are uniformly coated with of a layer of adsorbed hydrogenated lecithin or with a layer of adsorbed reaction product of hydrogenated lecithin with a water-soluble metal salt, said hydrogenated lecithin having an iodine value of less than 30.

4,622,075

METAL CLEANING

Ben R. Bogner, Wheaton, Ill., assignor to QO Chemicals, Inc., Oak Brook, Ill.

Continuation of Ser. No. 661,113, Oct. 15, 1984, abandoned.
This application Nov. 12, 1985, Ser. No. 797,158
Int. Cl.[4] B08B 7/00
U.S. Cl. 134—22.14 6 Claims

1. A process for cleaning a metal, plastic or wood surface on which there is a build-up of a residue resulting from curing of a resin while said resin is in contact with said surface which comprises:

applying to said metal, plastic or wood surface a solution of a copolymer of N-vinyl-2-pyrrolidone and maleic acid,

drying said solution of N-vinyl-2-pyrrolidone and maleic acid to form a film, and

separating said film together with said residue from the metal, plastic or wood surface.

4,622,076

METHOD FOR WASHING AN IMMUNOASSAY TRAY AND ITS APPARATUS

Chung-Mei Ling, Hsin Chu, Taiwan, assignor to General Biologicals Corp., Taiwan

Filed Aug. 6, 1985, Ser. No. 762,760
Int. Cl.[4] B08B 1/02
U.S. Cl. 134—32 3 Claims

1. A method of cleaning an assay tray having reaction wells opening to one side of the tray receiving reaction beads respectfully, said method comprising the steps of:

placing a solid pad of absorbent material over said one side of said assay tray;

inverting the assay tray together with the pad to let the liquid contents in the wells be absorbed by the pad;

removing the tray from the pad and placing the assay tray carrying the reaction beads in a housing frame, having a network of intersecting ribs forming holes in a frame wall facing said wells with said networks of ribs extending over the reaction wells for the assay tray to screen the reaction beads in such a manner that the reaction beads are retained in the respective reaction wells;

submerging the housing frame in a wash-liquid; and

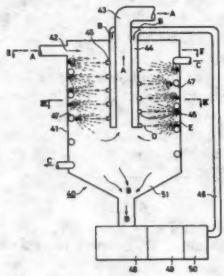
agitating the wash-liquid relative to said tray to rinse thoroughly the wells of the assay tray.

4,622,077

METHOD OF CLEANING THE INSIDE OF A ROOM

Masahiko Izumi, 13-14, 2-chome, Nishimagome, Oota-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 591,792, Mar. 21, 1984, abandoned. This application Jul. 3, 1985, Ser. No. 753,583
Int. Cl.[4] B08B 3/00
U.S. Cl. 134—36 3 Claims



1. A method of cleaning the inside of a room using a water injection apparatus including a cylindrical enclosure having an interior wall and a water injection pipe supported concentrically by, and extending through, an end wall of the enclosure, the pipe including a plurality of radially directed nozzles disposed along a portion of the pipe located within the enclosure, the method comprising the steps of:

injecting water at a pressure of 0.3 to 5.5 kg/cm^2 (gage pressure) from said plurality of nozzles of said injection pipe, each nozzle having an injection opening of a diameter in the range of 0.2 to 8 mm in order to cause the water to strike against said interior wall of the water injection apparatus enclosure, the side wall being 10 to 150 cm away from the nozzles, and thereby form a large number of mist particles;

forming a suspension of mist particles of not less than 2,000,000 particles per cubic foot of air with particle sizes of essentially not more than 0.5 microns by circulating air through said large number of mist particles resulting from said injecting step, while

simultaneously separating from said suspension particles of said formed mist of larger size than 0.5 microns by centrifugal effect due to the circulastion of air; and

circulating the resulting gas-water suspension created in the water injection apparatus through the room.

4,622,078

PROCESS FOR THE ZINC/CALCIUM PHOSPHATIZING OF METAL SURFACES AT LOW TREATMENT TEMPERATURES

Reinhard Opitz, Duren, and Manfred Breuer, Pulheim, both of Fed. Rep. of Germany, assignors to Gerhard Collardin GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 20, 1985, Ser. No. 703,251
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407513
Int. Cl.[4] C23C 22/12
U.S. Cl. 148—6.15 Z 14 Claims

1. A process for phosphatizing metal surfaces with an acidic phosphatizing solution containing zinc ions, calcium ions, phosphate ions and accelerators consisting essentially of contacting said metal surfaces after degreasing and without activation with an aqueous solution at a temperature of from 30° to 65° C., said aqueous solution containing

(a) more than 0.5 to 1.5 g.l^{-1} of Ca^{2+},

(b) 0.5 to 1.5 g.l^{-1} of Zn^{2+},

(c) 10 to 50 g.l^{-1} of PO_4^{3-},

(d) at least one accelerator selected from the group consisting of:

0.5 to 30 g.l^{-1} of NO_3^-,

0.01 to 0.6 g.l^{-1} of NO_2^-,

0.2 to 10 g.l^{-1} of ClO_3^-,

0.1 to 2 g.l^{-1} of an organo nitro compound,

0.01 to 0.5 g.l^{-1} of an inorganic peroxide or hydrogen peroxide,

and mixtures thereof

which aqueous solution having a pH of from 2.2 to 3.8, a ratio of free acid to total acid of from 1:10 to 1:60 and a ratio by weight of $(Ca^{2+}+Zn^{2+})$ to PO_4^{3-} of from 1:>8 to 1:40 and wherein the weight ration of zinc ions to calcium ions is from 1:0.5 to 1:1.5.

4,622,079

METHOD FOR THE DISPERSION OF HARD ALPHA DEFECTS IN INGOTS OF TITANIUM OR TITANIUM ALLOY AND INGOTS PRODUCED THEREBY

Winston H. Chang, Cincinnati, Ohio; Robert A. Sprague, Danvers, Mass., and Joseph A. Stahl, Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

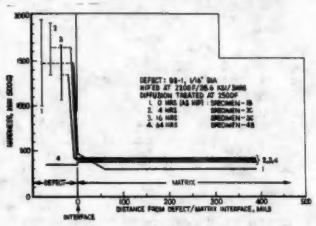
Filed Mar. 22, 1985, Ser. No. 714,758
Int. Cl.[4] C22F 1/18
U.S. Cl. 148—11.5 F 27 Claims

1. A method for the elimination of hard alpha defects from castings or ingots of titanium or titanium alloy comprising the steps of:

(a) bringing the ingot or ingots to a substantially uniform temperature throughout of between about 2500° to about 2800° F.,

(b) holding said ingot or ingots for a period of time sufficient

to cause homogenization to occur between said hard alpha defects and the titanium or titanium alloy matrix, and



(c) cooling said ingot or ingots from said substantially uniform temperature to room temperature or a lower temperature for further processing.

4,622,080

GUN BARREL, MANDREL AND RELATED PROCESSES

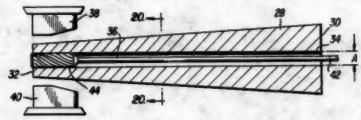
Wolfgang Wegwerth, Oberndorf-Neckar, Fed. Rep. of Germany, assignor to American Metal-Tech, Ltd., Alexandria, VA

Continuation of Ser. No. 527,668, Aug. 30, 1983, abandoned. This application Mar. 24, 1986, Ser. No. 843,865

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1983, 3300175

Int. Cl.[4] C21D *9/12*

U.S. Cl. 148—12 R **24 Claims**



1. A process for producing a gun barrel comprising the steps of:

I. inserting a mandrel into a tube having an inside diameter greater than the outside diameter of the mandrel; and then

II. collapsing the tube radially inwardly to mechanically deform the tube until the inside of the tube takes the form of the outside of mandrel; and then

III. removing the mandrel from the tube; and then

IV. heating the tube to a temperature above the recrystallization temperature to the metal but below the melting point of the metal; and then

V. quenching the tube; and then

VI. tempering the tube to produce a gun barrel having an inside diameter of greater than 20 mm.

4,622,081

FORMABLE, TEMPERATURE-RESISTANT MARTENSITIC STEEL HAVING ENHANCED RESISTANCE TO WEAR

Charles A. Stickels, Ann Arbor, and Claude M. Mack, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 14, 1984, Ser. No. 681,723

Int. Cl.[4] E22C *38/12*

U.S. Cl. 420—111 **11 Claims**

1. A hybrid martensitic tool steel/carburizing steel characterized by (i) enhanced resistance to hardening degration under high temperatures, (ii) ease of softening for formability and machinability, and (iii) ease of heat treating for secondary hardening, consisting essentially of: (a) amounts of carbon, manganese, and silicon associated with a plain, low carbon steel with Si in the range of 0.15–0.35% and Mn 0.25–0.5%, (b) alloying ingredients, and (c) the remainder essentially Fe, said alloying ingredients consisting essentially of, by weight, 2.0–3.5% Mo, 0–0.45% V, and 0–0.75 Cr, said steel being characterized by a martensitic matrix with the predominant carbides being precipitates of M_2C resistant to coarsening at 50° C. or lower where M represents molybdnum or molybdenum in combination with minimum amounts of Cr and/or V.

4,622,082

CONDITIONED SEMICONDUCTOR SUBSTRATES

William Dyson, St. Peters, and Jon A. Rossi, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 25, 1984, Ser. No. 607,996

Int. Cl.[4] H01L *21/324, 21/322*

U.S. Cl. 148—33 **10 Claims**

1. A process for thermally conditioning oxygen containing n+ type semiconductor materials to enhance their internal gettering characteristics comprising heating said material at a temperature of 1050° to 1200° C. in an oxidizing atmosphere for a sufficient period of time to denude the surface region of oxygen and then at a temeprature of 500° to 900° C. in a reducing atmosphere for a sufficient period of time to nucleate the oxygen.

4,622,083

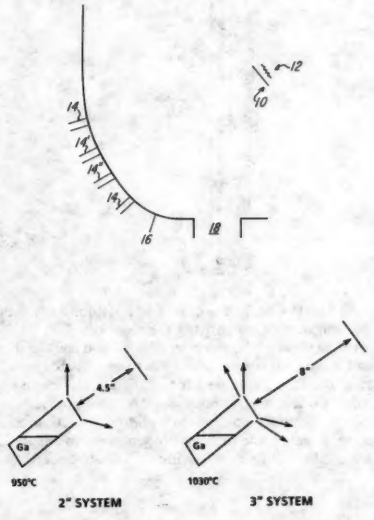
MOLECULAR BEAM EPITAXIAL PROCESS

Hung-Dah Shih, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 697,302, Jan. 1, 1985. Filed Mar. 11, 1985, Ser. No. 710,199

Int. Cl.[4] H01L *21/203, 21/477*

U.S. Cl. 148—175 **6 Claims**



1. A method for growing epitaxial layers consisting essentially of III–V semiconductor material, comprising the steps of:

providing a crystalline substrate;

suspending said substrate in an ultra-high vacuum and facing a plurality of effusion cells;

heating at least one of said effusion cells containing a group V element while maintaining each of said effusion cells containing a group III element at a temperature at least 100 degrees C. below a growth effusion temperature for said cell, said heated effusion cell containing a group V element to provide a vapor pressure of said group V element at the surface of said substrate which is approximately in equilibrium with a group V component of the

surface of said substrate at a predetermined growth surface temperature;

heating said substrate to at least ⅔ of said growth surface temperature in degrees Kelvin while maintaining all of said effusion cells containing group III elements at temperatures at least 100 degrees C. below growth effusion temperatures for said cells;

maintaining said substrate at said at least ⅔ of said growth surface temperature while heating another one of said effusion cells containing a group III element to a predetermined growth effusion temperature:

opening the shutter of said group III effusion cell while maintaining said substrate at said predetermined growth surface temperature, whereby epitaxial growth occurs on said substrate.

4,622,084

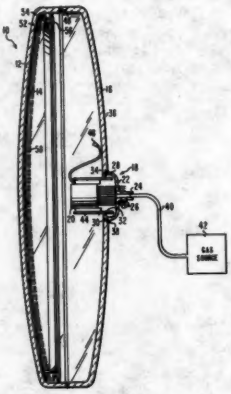
METHOD OF SEALING A MOUNT IN A CATHODE-RAY TUBE

Kern K. N. Chang; Anthony R. Cooke, both of Mercer County, and Kurt J. Sonneborn, Tewkesbury Township, Hunterdon County, all of N.J.

Filed Jan. 29, 1985, Ser. No. 696,158

Int. Cl.⁴ C03C *27/10*

U.S. Cl. 156—89 **9 Claims**



1. A method of sealing a mount of a cathode-ray tube to a back section thereof comprising the steps of:

applying a glass frit between an edge of said back section and said mount where the sealing is to be effected,

heating the mount and glass frit within a furnace to a temperature sufficient to cause said frit to become vitreous, thereby sealing said mount to said back section, and

flowing a gas containing hydrogen past an electron gun disposed in said mount during said heating step.

4,622,085

METHOD OF AND APPARATUS FOR INJECTING AN ADHESIVE

Shingo Yamada, and Kazuo Yamada, both of Nagoya, Japan, assignors to Ryowa Engineering Co., Ltd. and Nagoya General Bond Co. Ltd., both of Nagoya, Japan

Filed Feb. 14, 1986, Ser. No. 830,069

Int. Cl.⁴ B32B *35/00*

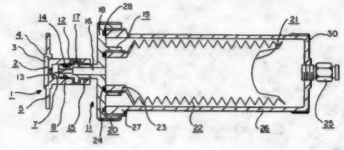
U.S. Cl. 156—94 **10 Claims**

1. A method of injecting an adhesive material into a cracked or delaminated section of a structure comprising the steps of

attaching a front piece to a target area,

engagingly connecting a deformable bag-like container containing an adhesive material to said front piece, and

sending a fluid with an adjustably controlled pressure into an external container which encloses said bag-like container therein and is connected to said front piece in an air-tight manner so as to apply said pressure uniformly to said



bag-like container, to compress said bag-like container and to inject said adhesive material out of said bag-like container through said front piece.

4,622,086

METHOD OF FABRICATING A HOLLOW BODY

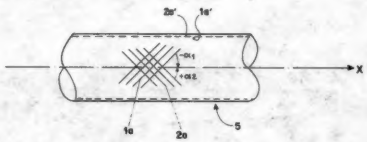
Alfred Pück, Am Ahlberg 33, 3524 Immenhausen-Mariendorf, and Thomas Rau, Liebenau/Niedermeiser, both of Fed. Rep. of Germany, assignors to Alfred Pück, Immenhausen-Mariendorf, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,602

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3432905

Int. Cl.⁴ B65H *81/00*

U.S. Cl. 156—166 **29 Claims**



1. A method of fabricating a hollow body, especially a tube, tubular torsion bar, pressure, vessel and the like, built-up with fiber-reinforced plastic material, and having at least two layers of fibers mutually differently oriented in relation to a longitudinal axis of the hollow body and the fibers of each layer extend at least partially in each such mutually different orientation over the entire hollow body and wherein the layers comprise a plastic which at least at a predetermined service temperature is hard-elastic, comprising the steps of:

fabricating the at least two layers with the fiber-reinforced hard-elastic plastic to form at least two fiber-reinforced layers;

mutually bonding the at least two layers by means of the hard-elastic plastic;

subsequently heating at least said hard-elastic plastic bonding the at least two layers between the at least two layers;

then subjecting at least one fiber-reinforced layer of said at least two fiber-reinforced layers to a least one force; and

thereafter cooling said at least one fiber-reinforced layer to below the glass transition temperature and then relieving said at least one force thus providing a residual prestress in the hollow body.

4,622,087

METHOD OF MAKING WELDABLE PIPE FITTINGS

Donald J. Ansell, Leicestershire, England, assignor to The Victaulic Company PLC, Hertfordshire, England

Filed Feb. 6, 1984, Ser. No. 577,075

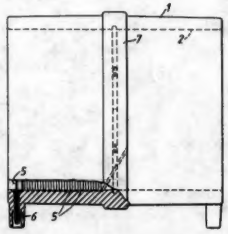
Claims priority, application United Kingdom, Feb. 18, 1983, 8304630; Mar. 1, 1983, 8305541

Int. Cl.⁴ B32B *31/18*

U.S. Cl. 156—242 **10 Claims**

1. A method of forming a weldable pipe fitting including a

thermoplastic sleeve having a bore and an internal wall defining said bore, comprising the steps of incising around the internal wall of the sleeve a helical cut inclined to the surface of the wall along the line of cut by means of a cutting tool, the cutting tool and its angular relationship to the bore of the sleeve being chosen such that during incision an internally



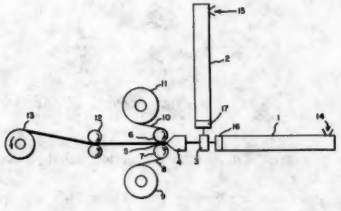
extending flap of thermoplastic material produced by the incision is caused to open out and deform transverse to the direction of incision whereby a helical cavity is formed within the sleeve wall; feeding into said cavity an electrical conducting wire; anchoring the ends of the electrical wire; and treating the internal surface of the sleeve so as to hold the wire within said cavity.

4,622,088

PROCESS FOR PREPARING PHOTOPOLYMER FLEXOGRAPHIC ELEMENT WITH MELT EXTRUSION COATED ELASTOMERIC SURFACE LAYER

Joon H. Min, Spotswood, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 18, 1984, Ser. No. 683,247
Int. Cl.[4] B32B *31/00;* **G03C** *1/68, 1/74*
U.S. Cl. 156—244.11 **19 Claims**



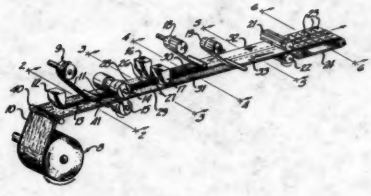
1. In a process for preparing a flexographic photopolymerizable element which comprises (a) passing into the nip of a calender a mass of a hot photopolymerizable composition comprising an elastomeric binder, an ethylenically unsaturated compound, and a photoinitiator or photoinitiator system, and while hot (b) calendering the photopolymerizable composition between a support and a multilayer cover element to form a photopolymerizable layer therebetween, the multilayer cover element consisting essentially of a flexible cover film and a layer of an elastomeric composition and optionally between the flexible cover film and the layer of elastomeric composition a flexible polymeric film, the layer of elastomeric composition being adjacent to the photopolymerizable layer and being photosensitive or becoming photosensitive during or after calendering by contact with the photopolymerizable layer, the improvement wherein at least the layer of elastomeric composition of the multilayer cover element is prepared by melt extrusion which comprises (i) feeding into an extruder and mixing at 100° to 300° C. an elastomeric polymeric binder, a second polymeric binder and a nonmigratory dye or pigment and optionally one or more ethylenically unsaturated compounds and/or photoinitiator or initiator system; (ii) passing the hot melted mixture at 100° to 300° C. into an extrusion die to form a layer, (iii) stretching the layer of extrudate as it passes out of the extrusion die to achieve the desired thickness, (iv) applying the layer of extrudate onto a removable cover film, and (v) optionally applying a flexible removable interleaf film over the bare surface of the extrudate layer.

4,622,089

METHOD OF MAKING BLISTER PAD ADHESIVE BANDAGE

Nels J. Lauritzen, Piscataway, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Division of Ser. No. 470,417, Feb. 28, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 726,170
Int. Cl.[4] A61L *15/00;* **B32B** *31/18, 31/20*
U.S. Cl. 156—250 **16 Claims**



1. A method for the continuous production of a plurality of adhesive strip bandages from a bulky heat-fusible, nonwoven material, said bandages comprising an elongated backing strip and a centrally positioned wound covering pad, said method comprising the steps of

(a) providing a first continuous source of said material for said backing strip having a width corresponding to the desired length of the bandage,

(b) providing a second continuous source of said material for said pad having a width at least equal to the desired length of said pad,

(c) centering the width of the pad material on the width of the backing material,

(d) securing the pad material to the backing material by compacting and heat-fusing said pad and backing materials along the edges of said pad material,

(e) compacting and heat-fusing the portions of the backing material extending beyond the width of the pad to obtain a dense sheet-like structure,

(f) applying a coating of a pressure-sensitive adhesive to one surface of said compacted portions of said backing,

(g) covering said adhesive-coated surface with a release liner, and

(h) cutting the resulting composite material into narrow strips across the width of the backing while simultaneously compacting and heat-fusing the pad and the backing along the cut edges thereof, whereby there are formed individual adhesive strip bandages comprising an adhesive coated backing strip and centrally located pad.

4,622,090

APPARATUS AND METHOD FOR GROOVING A LAMINATE SHEET

John Michaels, 16 Irvington, Tonawanda, N.Y. 14150

Filed Oct. 25, 1985, Ser. No. 791,336
Int. Cl.[4] B27F *1/04*
U.S. Cl. 156—257 **19 Claims**

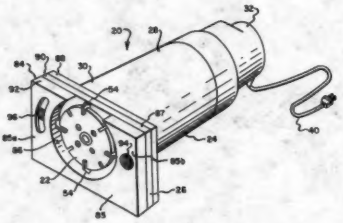
18. A method for laminating comprising the steps of:

providing a base panel defining two planar surfaces which meet at a right corner;

providing a planar laminate sheet structure having a layer of

a relatively rigid substrate material and a layer of flexible sheet material fixedly overlying said substrate layer;

providing a grooving apparatus including a rotating cutting blade including a circular body and means attached about the circumferential periphery of said blade body defining cutting edges providing in section, a V having an apex directed generally radially outwardly of said blade body for cutting a V-sectional groove in said laminate sheet structure as said blade is rotated within a rotational plane oriented generally perpendicular to laminate sheet structure and guided in grooving engagement therealong, the provided V having a projected height as said cutting edges are viewed in section which is about equal to the thickness of said substrate layer of said laminate sheet structure and having one leg which terminates at a point which rotates, as said blade is operatively rotated, within one blade plane oriented to one side of said blade body, said grooving apparatus further including means associ-



ated with said blade defining a first guide plane coincident with said one blade plane;

fixing a portion of said substrate side of said sheet structure to one planar surface of said base panel so that a marginal portion of said sheet structure extends from the right corner of said base panel and forms a right angle with the other planar surface of said base panel;

moving said grooving apparatus relative to said laminate sheet structure from one edge of said sheet to another with said first guide plane slidably engaging said other planar surface of said base panel and said blade being maintained at a grooving depth which is about equal to the projected height of the provided V so that a groove is formed in said laminate sheet structure wherein said substrate layer is substantially severed and said flexible sheet is left uncut;

folding the marginal portion of said laminate sheet structure about the formed groove and toward said other planar surface of said base panel; and

fixing the marginal portion against said other surface.

4,622,091

RESIN FILM INFUSION PROCESS AND APPARATUS

Leslie E. Letterman, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 29, 1984, Ser. No. 676,427
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—286 **52 Claims**

1. A method of forming fiber reinforced resin composites comprising the steps of:

creating a dry preform of at least two dry fiber plies, each of said dry fiber plies formed of a plurality of reinforcement fibers;

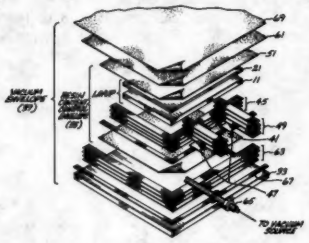
adding at least one layer of resin to said dry preform;

enclosing said dry preform and said at least one layer of resin in a resin content control envelope;

enclosing said resin content control envelope in a vacuum envelope;

evacuating said vacuum envelope and said resin content control envelope to withdraw air and other gases from said dry preform; and,

heating said dry preform and said at least one layer of resin simultaneously with the evacuation of said vacuum envelope and said resin content control envelope to cause said resin to melt, fully infuse said dry preform and, then, cure



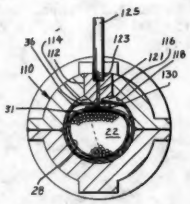
as air and other gases are withdrawn from said dry preform resulting in the creation of a fiber reinforced resin composite.

4,622,092

APPARATUS FOR MAKING A BONDED SHEATH CABLE

William D. Bohannon, Jr., Lawrenceville; Herbert E. Brent, Lilburn; Alfred S. Hamilton, Norcross, and Michael D. Kinard, Lawrenceville, all of Ga., assignors to AT&T Technologies, Berkeley Heights, N.J.

Division of Ser. No. 626,079, Jun. 29, 1984, Pat. No. 4,563,540.
This application May 31, 1985, Ser. No. 739,799
Int. Cl.[4] H01B *13/06*
U.S. Cl. 156—461 **3 Claims**



1. An apparatus for making a bonded sheath, filled cable, said apparatus comprising:

means for advancing a cable core filled with a waterproofing material;

means for enclosing the core in a strip of plastic material;

forming means for causing a metallic tape having a surface thereof coated with an adhesive material to be wrapped about the strip of plastic material to form a shield having a longitudinal overlapped seam which includes overlying and underlying edge portions and having the adhesive material facing outwardly with the underlying edge portion being directed generally inwardly and with the overlying edge portion being directed generally inwardly into engagement with the underlying edge portion;

means for causing a waterproofing material to be disposed between said strips of plastic material and said shield;

means for introducing a sealant material into the vicinity of the longitudinal edge portions of the tape as they are being overlapped to cause the sealant material to seal said overlapped seam and to cause the sealant material to flow circumferentially of said core to fill any cavities between said shield and said strip of plastic material in the vicinity of said seam; and

means for extruding a jacket of plastic material about said

shield and for causing said jacket to be bonded by said adhesive material to said shield.

4,622,093

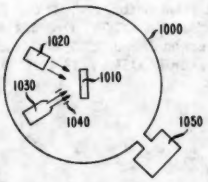
METHOD OF SELECTIVE AREA EPITAXIAL GROWTH USING ION BEAMS

Won-Tien Tsang, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 517,755, Jul. 27, 1983, abandoned. This application Jan. 8, 1986, Ser. No. 817,785

Int. Cl.[4] C30B *25/04*

U.S. Cl. 156—610 **9 Claims**



1. A method of epitaxially growing on selected areas within a larger area comprising the steps of: scanning a first beam of ionized Group III particles over said selected areas, said particles having an energy between 10 eV and 35 keV; and flooding said larger area with a second thermal beam of Group V particles thereby growing essentially one-dimensional features on said selected areas where said first beam and said second thermal beam impinge.

4,622,094

METHOD OF CONTROLLING DRY ETCHING BY APPLYING AN AC VOLTAGE TO THE WORKPIECE

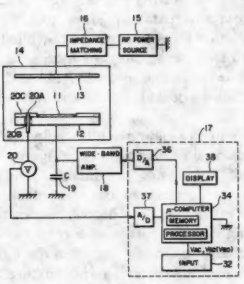
Toru Otsubo, Fujisawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 12, 1984, Ser. No. 680,838

Claims priority, application Japan, Dec. 14, 1983, 58-234319

Int. Cl.[4] H01L *21/306*

U.S. Cl. 156—627 **18 Claims**



1. A dry etching method comprising the steps of:

placing a workpiece on an electrode, said electrode being disposed in a processing chamber;

introducing an etching gas into said processing chamber;

exciting said etching gas to generate a plasma; and

applying a periodical voltage waveform V to said electrode, said periodical voltage waveform V having a first portion for allowing electrons to impinge the workpiece and a second portion for accelerating positive ions toward the workpiece, said second portion of the waveform including a first component for generating a substantially constant accelerating field and a second component for cancelling the effect of increasing charge-up at the workpiece surface, whereby positive ions are accelerated to substantially constant ion energy independently of the increasing charge up at the workpiece surface.

16. A method for dry-etching a workpiece placed in a reaction vessel by introducing a processing gas in the reaction vessel to a predetermined pressure, and exciting said gas to generate a plasma to process said workpiece while applying a bias voltage to the workpiece, comprising the steps of:

detecting the potential of said workpiece; and

applying an AC voltage to said workpiece which compensates variations in the detected potential of said workpiece so as to leave only a DC component.

4,622,095

LASER STIMULATED HALOGEN GAS ETCHING OF METAL SUBSTRATES

Warren D. Grobman, Yorktown Heights; Fahfu Ho, Wappingers Falls; Jerry E. Hurst, Jr., Croton-on-Hudson; John J. Ritsko, Mt. Kisco, and Yaffa Tomkiewicz, Scarsdale, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Oct. 18, 1985, Ser. No. 789,235

Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—635 **14 Claims**

1. A method of radiation induced dry etching of a metallized substrate comprising the steps of

(a) mounting the substrate in a reaction chamber,

(b) introducing into the chamber a halogen gas which is reactive with the substrate to form a metal halide salt reaction product,

(c) projecting a patterned beam of laser radiation onto the substrate at a wave-length suitable for absorption by the metal halide to accelerate the reaction between the halogen gas and the substrate in the patterned areas without substantial removal of the reaction product which forms therein, and then

(d) removing the metal halide reaction product from the substrate by contact of the substrate with a solvent for the metal halide salt reaction product.

4,622,096

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE COMPRISING A SILICON BODY, IN WHICH A SUNKEN OXIDE LAYER IS LOCALLY PROVIDED

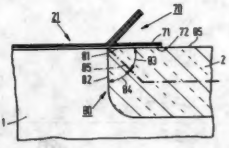
Jan G. Dil, and Johan W. Bartsen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1985, Ser. No. 729,843

Claims priority, application Netherlands, May 29, 1984, 8401711

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **10 Claims**



1. A method of manufacturing a semiconductor device comprising a silicon body, in which a sunken oxide layer is locally provided, in which method, after a first oxidation mask has been locally provided on a surface of the silicon body, a depression with side walls extending at least in part below the first oxidation mask is formed in the silicon body, whereupon the silicon body is subjected to an oxidation treatment after a second oxidation mask adjoining the first oxidation mask has been provided on the side walls of the depression, character-

ized in that the depression is provided with side walls having a comparatively flat surface at an angle of 25° to 45° with the original surface of the silicon body, and in that the second oxidation mask is formed by a 5 to 50 nm thick layer of silicon nitride or silicon oxynitride applied to the side wall of the depression directly or separated therefrom by a silicon oxide layer having a thickness of less than 5 nm.

4,622,097

PROCESS FOR PRODUCING COPPER THROUGH-HOLE PRINTED CIRCUIT BOARD

Minoru Tsukagoshi; Takuo Nakayama, both of Kawagoe; Masahiko Minagawa, Asaka, and Shuji Yoshida, Kawagoe, all of Japan, assignors to Shikoku Chemicals Corporation, Kagawa, Japan

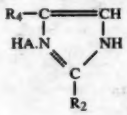
Filed Oct. 7, 1985, Ser. No. 784,751

Claims priority: application Japan, Oct. 11, 1984, 59-213304

Int. Cl.[4] **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—644 **3 Claims**

1. A process for producing a copper through-hole printed circuit board, which comprises forming a required pattern on a copper-clad laminated plate using a resist ink soluble in an alkaline aqueous solution, immersing the copper-clad laminated plate in an aqueous solution of a salt of an alkylimidazole compound represented by the following general formula



wherein R_2 represents an alkyl group having 5 to 21 carbon atoms, R_4 represents a hydrogen atom or a methyl group, and HA represents an organic or inorganic acid, to form on the copper surface of the copper-clad laminated plate an etching resist film composed of the alkylimidazole compound, drying the resulting copper-clad laminated plate, and then treating it with an alkaline etching solution.

4,622,098

METHOD FOR MANUFACTURING SEMICONDUCTOR STRAIN SENSOR

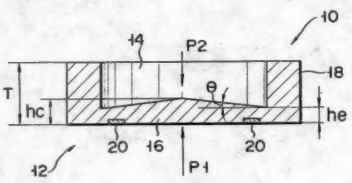
Nobuo Ochisi, Kawasaki, and Takashi Tsumagari, Zama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 545,264, Oct. 25, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 820,598

Claims priority, application Japan, Oct. 27, 1982, 57-187471; May 16, 1983, 58-84171

Int. Cl.[4] **H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—645 **5 Claims**



1. A method for manufacturing a semiconductor strain sensor, comprising the steps of:

forming resistance layers on one of major surfaces of a semiconductor substrate having a pair of major surfaces which are parallel to each other;

forming a circular blind hole by grinding from the other major surface of the semiconductor substrate having the resistance layers and forming the bottom surface of the blind hole in a conical shape which projects upward from an edge portion to a central portion thereof, thereby working the semiconductor substrate to constitute a thin diaphragm and a frame; and

etching an inner surface of the blind hole to eliminate a scratch formed in the inner surface of the blind hole by grinding.

4,622,099

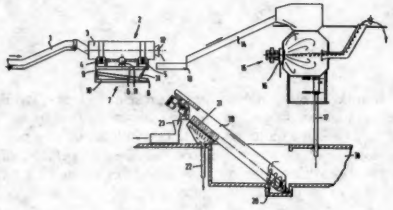
METHOD AND APPARATUS FOR MANUFACTURING PAPER AND BOARDS

Pieter Eelman, Finsterwolde, Netherlands, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Continuation of Ser. No. 557,744, Dec. 2, 1983, abandoned. This application Jun. 3, 1985, Ser. No. 740,318

Int. Cl.[4] **D21B** *1/32;* **D21C** *5/02*

U.S. Cl. 162—4 **15 Claims**



1. A method for forming a fibrous suspension from a fibrous base material of waste paper, said method comprising the steps of:

introducing into rotating pre-soaking device the fibrous base material and admixing said base material with a sufficient predetermined quantity of water to form a fibrous mixture, said pre-soaking device being rotatably mounted about its longitudinal axis and including a tiltable support frame for adjusting the angle of inclination of said device at multiple positions about an axis of rotation; and

introducing into a pulper a controlled amount of the fibrous mixture by downwardly pivoting the rotating pre-soaking device from a horizontal position to a downwardly projecting position so as to cause a controlled amount of the mixture to flow into conveyor means for conveying the mixture into the pulper and admixing said mixture with a further quantity of water so as to form a fibrous suspension.

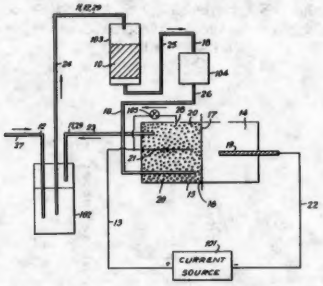
6. Apparatus in association with a pulper for processing a fibrous base material of waste paper into a fibrous suspension, said apparatus comprising a mixing container rotatably mounted about its longitudinal axis on a tiltable support frame, feed means for introducing the fibrous base material and water into said mixing container so as to form a mixture, discharge means for discharging the mixture from the mixing container, conveying means for conveying the mixture to the pulper, control means for regulating the amount of the mixture produced in the mixing container and adjusting means which operate in cooperation with said frame for fixably establishing the angle of inclination of the mixing container relative to a horizontal line, wherein said adjusting means and said discharge means cooperate to control the amount of mixture discharged from the mixing container, and wherein the adjusting means are structured so that the inclination of the mixing container can be adjusted at various positions about an axis of rotation which is perpendicular to the longitudinal axis from a position in which the longitudinal axis coincides with the horizontal line to a position wherein the longitudinal axis is tilted downwardly at the discharge side.

4,622,100

PROCESS FOR THE DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL WITH OXYGEN, FERRICYANIDE, AND A PROTECTOR

Madhu P. Godsay, Monroe; Michael N. Hull, Bardonia, and Vacheslav M. Yasnovsky, Orangeburg, all of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,299
Int. Cl.[4] D21C 9/147
U.S. Cl. 162—65 16 Claims



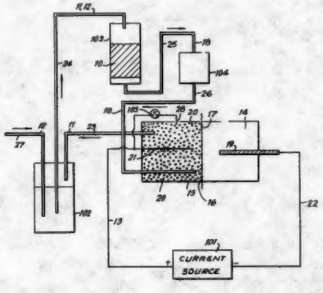
1. A process for the delignification of lignocellulosic material which comprises reacting said lignocellulosic material with about 0.004% to about 0.400%, by weight of oven-dried pulp, of electrochemically generated ferricyanide ion in a substantially aqueous solution which is at least saturated with oxygen at normal atmospheric pressure at alkaline pH and at a temperature from about 0° C. to about 65° C. in the presence of a cellulose viscosity protective amount of a cellulose protective compound selected from the group consisting of water soluble alcohols, water soluble primary and secondary amines, comopounds capable of being hydrolyzed to produce said primary and secondary amines, dilower alkyl sulfoxides, water soluble ethers and mixtures thereof.

4,622,101

METHOD OF OXYGEN BLEACHING WITH FERRICYANIDE LIGNOCELLULOSIC MATERIAL

Michael N. Hull, Bardonia, and Vacheslav M. Yasnovsky, Orangeburg, both of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,298
Int. Cl.[4] D21C 9/147
U.S. Cl. 162—65 10 Claims



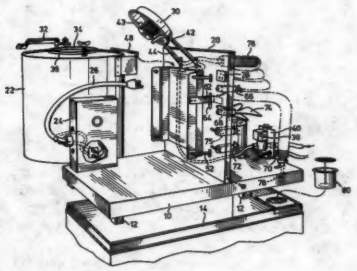
1. A process for the delignification of lignocellulosic material which comprises reacting said lignocellulosic material with about 0.004% to about 0.400%, by weight of oven-dried pulp, of electrochemically generated ferricyanide ion in a substantially aqueous solution which is at least saturated with oxygen at normal atmospheric pressure at alkaline pH and at a temperature from about 0° C. to about 65° C.

4,622,102

AUTOMATICALLY OPERABLE DISTILLATION APPARATUS

Howard Diebel, St. Catherines, Canada, assignor to Moyer Diebel Limited, Jordan Station, Canada

Filed May 29, 1985, Ser. No. 738,915
Int. Cl.[4] B01D 3/42
U.S. Cl. 202—185.3 4 Claims



1. Distillation apparatus comprising:

a baseplate;

a vertical structure mounted on the baseplate;

a boiler container support means mounting the boiler container support on the vertical structure for vertical movement relative thereto;

a boiler container for containing water to be boiled therein removably mounted on the boiler container support, whereby the weight thereof and of the contained water will urge the boiler container support downwards;

an electric heater mounted on the boiler container for boiling the water therein;

spring means operative between the container support and the vertical structure to oppose the said downwards movement of the container support under the weight of the boiler container and the contained water;

an electrically-operated water supply valve mounted on the baseplate and connected by pipe means to the boiler container for supply of water to the interior thereof;

first switch means operated in response to upward movement of the container support and connected to supply operating power to the electrically-operated water supply valve when the weight of the boiler container has decreased by a predetermined amount to open the valve for the supply of replacement water to the container interior;

a water vapour condenser mounted on the baseplate;

pipe means connecting the boiler container interior and the condenser interior to supply vapour from the boiler container interior to the condenser interior;

an electric fan mounted by the baseplate to deliver cooling air to the condenser;

second switch means operated in response to upward movement of the boiler container support and connected to the heater to stop it when the weight of the boiler container has decreased by a predetermined amount; and

switch operating means on the boiler container support for said operation of the first and second switch means upon said upward movement thereof.

4,622,103
WATER STILL WITH A CYCLONE LIQUID-VAPOR SEPARATOR

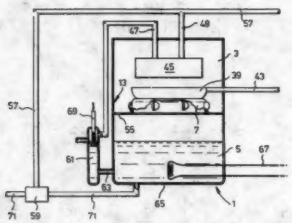
John R. R. Shirley-Elgood, Leicester; Geoffrey A. Roulstone, Loughborough, and Mahendra R. Thakkar, Leicester, all of England, assignors to Fisons plc, Ipswich, England

Continuation of Ser. No. 533,059, Sep. 16, 1983, abandoned. This application Dec. 27, 1985, Ser. No. 815,301

Claims priority, application United Kingdom, Sep. 29, 1982, 8227805; Mar. 11, 1983, 8306706; Mar. 24, 1983, 8308094

Int. Cl.[4] B01D *3/02*; C02F *1/04*

U.S. Cl. 202—185 E 10 Claims



1. In an enclosed, walled water still for providing distilled water and having a lower water boiler chamber and an upper condensor chamber with a condensor coil, the improvement of providing distilled water with low conductivity, said improvement comprising:

a cyclone liquid/vapor separator in the form of a capped annulus mounted between the water still walls and intermediate the lower water boiler chamber and the upper condensor chamber for removing droplets from vapor,

the capped annulus having a plurality of jets for imparting a spiralling motion to droplets and vapor entering said annulus from the water boiler and urging the droplets to impinge on an interposed deflecting surface;

a distillate receiver integrally formed on top of said cyclone liquid/vapor separator with the receiver bottom formed integrally with the top of said capped annulus and with the condensor coil mounted above the distillate receiver; and

means enabling the vapor separated from the droplets to impinge on the condensor coil to form water collected in the bottom of the distillate receiver.

4,622,104
PROCESS FOR THE RECOVERY OF ETHYLENE GLYCOL IN CONCENTRATED FORM

Henri Néel, Le Havre, and Francis Delannoy, Pierre-Benite, both of France, assignors to Atochem, France

Filed Jul. 16, 1984, Ser. No. 631,166

Claims priority, application France, May 15, 1984, 84 07695

Int. Cl.[4] B01D *3/00*

U.S. Cl. 203—18 3 Claims

1. A process for the separation of ethylene glycol from glycolated water containing salts obtained from the bottom of an ethylene oxide desorption column in a process for the manufacture of ethylene oxide by catalytic oxidation of ethylene by oxygen in the vapor phase comprising feeding said glycolated water; without prior separation of the salts contained therein, directly from the bottom of said ethylene oxide desorption column into the top of an ethylene glycol separation column having therebelow up to 12 theoretical plates and adding sufficient indirect heat to said glycolated water to form two streams; a first gaseous stream consisting essentially of steam which is removed from the top of said ethylene glycol separation column and introduced into said ethylene oxide desorption column to serve therein as the desorption fluid and a second aqueous stream containing from about 40% to 90% by weight of ethylene glycol and salts which is removed from the bottom of said ethylene glycol separation column; the mean absolute pressure in said ethylene glycol separation column being at least equal to the pressure of said ethylene oxide desorption column.

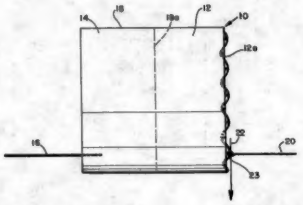
4,622,105
METHOD FOR MEASURING GASEOUS SULFUR DIOXIDE

Qing-Guo Liu, Philadelphia, and Wayne L. Worrell, Narberth, both of Pa., assignors to University Patents, Inc., Norwalk, Conn.

Continuation of Ser. No. 303,320, Sep. 17, 1981, abandoned. This application Apr. 30, 1984, Ser. No. 605,708

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—1 T 6 Claims



1. A method for measuring sulfur dioxide or sulfur trioxide in an oxygen-containing gas comprising:

contacting the gas with a solid electrolyte comprising lithium sulfate and silver sulfate,

the electrolyte being in electrical contact with a solid reference electrode comprising lithium sulfate, silver sulfate and silver in intimate admixture; and

measuring the electrical potential between the electrolyte and the reference electrode;

said electrolyte being maintained at a temperature during the contacting wherein it comprises two conductive phases.

4,622,106
METHODS FOR PRODUCING PRINTED CIRCUITS

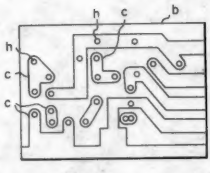
Naoaki Kitagawa, Kanagawa, Japan, assignor to Marui Industry Co., Ltd., Tokyo, Japan

Filed May 22, 1984, Ser. No. 612,785

Claims priority, application Japan, May 23, 1983, 58-90523

Int. Cl.[4] C25D *5/02*

U.S. Cl. 204—15 7 Claims



1. A method for producing a printed circuit board including the steps of:

printing on a surface of a base plate a first masking layer having a non-masking circuit pattern from an ink which can be detached from said plate;

forming a metal layer on said plate provided with said first masking layer by vacuum evaporation or sputtering;

forming a second masking layer on said metal layer, said second masking layer covering portions of said metal layer corresponding to areas other than said non-masking

circuit pattern and covering desired portions of said metal layer corresponding to said non-masking pattern;

then, plating said plate by placing said plate in a plating bath and connecting a plating electrode to said metal layer so that additional metal is deposited onto portions of said metal layer not masked by said second masking layer; and

removing said ink of said first masking layer and said metal thereon and said second masking layer, thereby leaving remaining metal as a circuit including relatively thick, low resistivity portions corresponding to said portions of said metal layer not masked by said second masking layer and relatively thin, high resistivity portions corresponding to said portions of said metal layer covered by said second masking layer.

4,622,107

PROCESS FOR PREPARING THE THROUGH HOLE WALLS OF A PRINTED WIRING BOARD FOR ELECTROPLATING

Anthony M. Piano, Lodi, N.J., assignor to Olin Hunt Specialty Products Inc., Palisades Park, N.J.

Filed May 5, 1986, Ser. No. 859,661
Int. Cl.[4] C25D *5/02, 5/54*
U.S. Cl. 204—15 **15 Claims**

1. In the process for electroplating the walls of through holes in a laminated printed wiring board comprised of at least one non-conducting layer laminated to at least two separate conductive metal layers, which comprises the steps:

(a) contacting said printed wiring board having said through holes with a liquid dispersion of carbon black comprised of:

(1) carbon black particles having an average particle size of less than about 3.0 microns in said dispersion;

(2) an effective dispersing amount of a surfactant which is compatible with said carbon black; and

(3) a liquid dispersing medium, wherein the amount of carbon black is sufficient to coat substantially all of said non-conducting surfaces and is less than about 4% by weight of said liquid dispersion;

(b) separating substantially all of the liquid dispersing medium from said dispersion, thereby depositing said carbon black particles in a substantially continuous layer on said non-conducting portions of said hole walls;

(c) microetching said metal layers of said printed wiring board to remove deposited carbon black therefrom;

(d) rinsing said printed wiring board to remove residual microetch therefrom; and

(e) electroplating a substantially continuous metal layer over the deposited carbon black layer on said non-conducting portions of hole walls, thereby electrically connecting said metal layers of said printed wiring board;

wherein said improvement comprises:

contacting said deposited carbon black particles after step (b) and before step (c) with aqueous solution of a gas-forming compound selected from an alkaline carbonate, an alkaline sulfite and mixtures thereof.

4,622,108

PROCESS FOR PREPARING THE THROUGH HOLE WALLS OF A PRINTED WIRING BOARD FOR ELECTROPLATING

Frank Polakovic, Ringwood, and Anthony M. Piano, Lodi, both of N.J., assignors to Olin Hunt Specialty Products, Inc., Palisades Park, N.J.

Filed May 5, 1986, Ser. No. 859,671
Int. Cl.[4] C25D *5/02, 5/54*
U.S. Cl. 204—15 **15 Claims**

1. In a process for electroplating the walls of through holes in a laminated printed wiring board comprised of at least one non-conducting layer laminated to at least two separate conductive metal layers, which comprises the steps:

(a) contacting said printed wiring board having said through holes with an alkaline dispersion of carbon black comprised of:

(1) carbon black particles having an average particle size of less than about 3.0 microns in said dispersion;

(2) an effective dispersing amount of a surfactant which is compatible with said carbon black; and

(3) a liquid dispersing medium, wherein the amount of carbon black is sufficient to coat substantially all of said non-conducting surfaces and is less than about 4% by weight of said liquid dispersion;

(b) separating substantially all of the liquid dispersing medium from said dispersion, thereby depositing said carbon black particles in a substantially continuous layer on said non-conducting portions of said hole walls; and

(c) electroplating a substantially continuous metal layer over the deposited carbon black layer on said non-conducting portions of hole walls, thereby electrically connecting said metal layers of said printed wiring board;

the improvement which comprises:

contacting the non-conducting portions of said through holes immediately before step (a) with a pre-conditioning solution comprising an aqueous solution of an alkaline hydroxide wherein the alkaline hydroxide is present in a sufficient amount to wet said non-conductive portions of said through holes.

4,622,109

SOLID ELECTROLYTE CAPACITOR PROCESS

Henry F. Puppolo, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jun. 7, 1985, Ser. No. 742,347
Int. Cl.[4] H01G *9/24*
U.S. Cl. 204—38.3 **7 Claims**

1. A process for making a solid electrolyte capacitor comprising anodizing a porous valve-metal anode pellet to form a dielectric oxide thereon, depositing a layer of solid electrolyte over said dielectric oxide, depositing at least one carbon layer over said solid electrolyte, one carbon layer containing particles of at least one metal which is more electropositive than a subsequently deposited solderable metal, and depositing said solderable metal onto said carbon layer by a chemical replacement reaction carried out by treating said carbon layer with a metal salt solution to replace said more electropositive metal in said carbon layer by the metal of said metal salt.

4,622,110

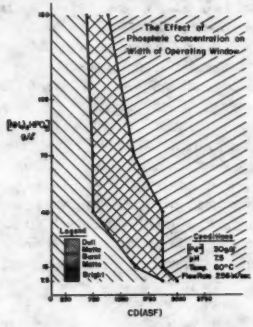
PALLADIUM PLATING

James L. Martin, Merrick; John E. McCaskie, No. Merrick, and Michael P. Toben, Oceanside, all of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Division of Ser. No. 639,401, Aug. 10, 1984, Pat. No. 4,545,868, which is a continuation of Ser. No. 549,375, Nov. 7, 1983, abandoned, which is a continuation of Ser. No. 309,096, Oct. 6, 1981, abandoned. This application Apr. 17, 1985, Ser. No. 724,130
Int. Cl.[4] C25D *3/50*
U.S. Cl. 204—47 **2 Claims**

1. An additive-free fast precipitating electrolyte bath for precipitating palladium layers comprising at least about 10 g/l palladium metal in the form of a palladium tetra-amino com-

plex and a phosphate compound which provides an amount of phosphate anion which would be equivalent to that provided



by between about 20 g/l and about 80 g/l of ammonium phosphate; said bath having a pH of between about 7 and 9.

4,622,111

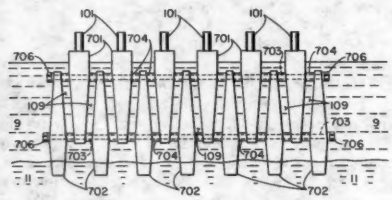
APPARATUS AND METHOD FOR ELECTROLYSIS AND INCLINED ELECTRODES

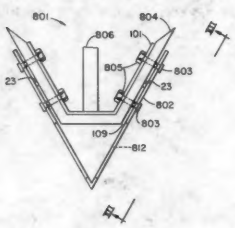
Melvin H. Brown, Allegheny Township; William C. Patterson, Penn Hills, and Noel Jarrett, Lower Burrell, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 26, 1983, Ser. No. 488,754

Int. Cl.⁴ C25C *3/06, 7/02;* C27C *3/00;* C25B *1/00*

U.S. Cl. 204—67 **15 Claims**





15. A method of electrolysis comprising:

establishing first and second inclined electrodes in an electrolytic cell having an internal cell surface for containing an electrolyte and a separate liquid pad of molten metal;

supporting said first electrode essentially free from said internal cell surface;

adjusting said first electrode and said second electrode against a spacer positioned between said first and second electrodes to form an essentially fixed anode-cathode distance; and

connecting said first electrode electrically with said liquid pad along a path of higher conductivity than said electrolyte.

4,622,112

PROCESS FOR PREPARING CHLORINATED POLYVINYL AROMATIC COMPOUNDS

Hiroyuki Watanabe, and Toru Seita, both of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

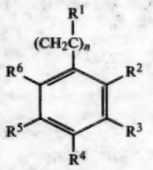
Filed Mar. 19, 1985, Ser. No. 713,380

Claims priority, application Japan, Mar. 19, 1984, 59-51069; Mar. 19, 1984, 59-51071

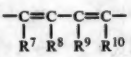
Int. Cl.⁴ C25B *3/06*

U.S. Cl. 204—81 **6 Claims**

1. A process for the preparation of a chlorinated polyvinyl aromatic compound comprising electrolyzing a polymer solution of a polyvinyl aromatic compound represented by formula (I):


(I)

wherein each of R^1, R^2, R^3, R^4, R^5 and R^6 is selected from hydrogen and an alkyl group containing from 1 to 6 carbon atoms, and R^4 and R^5 or R^5 and R^6 can together form a ring by



wherein each of R^7, R^8, R^9 and R^{10} is selected from hydrogen and an alkyl group containing from 1 to 6 carbon atoms, and n is from 50 to 30,000, which polymer is dissolved in an organic solvent which is not substantially soluble in water and electrolyzing being in an aqueous solution containing chloride ions, the chlorinated polyvinyl aromatic compound prepared having substantially the same molecular weight distribution as the polyvinyl aromatic compound.

4,622,113

PROCESS FOR PRODUCING CAUSTIC ALKALIS

Takao Satoh; Masaki Murakami; Nobuhiro Kawasaki, all of Yamaguchi; Teruo Ichisaka, and Shinji Katayama, both of Okayama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo and Chlorine Engineers Corp., Ltd., Tokyo, both of, Japan

Filed Nov. 19, 1984, Ser. No. 673,122

Claims priority, application Japan, Nov. 17, 1983, 58-216613; Nov. 22, 1983, 58-220030

Int. Cl.⁴ C25B *1/16*

U.S. Cl. 204—98 **3 Claims**

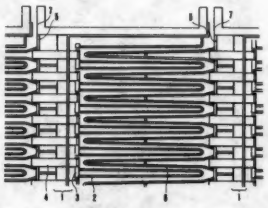
1. A process for producing caustic alkalis or alkaline hydroxides by electrolysis in a bipolar-type electrolysis cell containing a plurality of finger anodes extending into the electrolysis cell from one of two opposing partitioning walls and a plurality of finger cathodes extending from the partitioning wall not having anodes extending therefrom, said anodes and cathodes being positioned in such a way that the electrodes extending from one given partitioning wall project into the space between adjacent electrodes extending from the remaining partitioning wall while maintaining a narrow gap between alternating cathodes and anodes, and said cell containing a continuous cation exchange membrane which separates the anodes and

cathodes and which divides the electrolysis cell into an anode compartment containing an alkali chloride solution and a cathode compartment containing water or a dilute solution of an alkali hydroxide, comprising:

conducting the electrolysis of the alkali chloride;

transferring the catholyte which is formed in the cathode compartment and which contains alkali hydroxide and bubbles of hydrogen into a gas-liquid separating means installed at the top of the cathode compartment; and

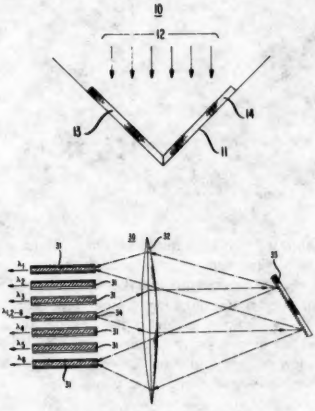
maintaining the level of the liquid in the gas-liquid separating means higher than the level of the anolyte which causes the cation exchange membrane to be pushed toward the anode surface by the pressure which results from the difference in the two liquid levels.



4,622,114
PROCESS OF PRODUCING DEVICES WITH PHOTOELECTROCHEMICALLY PRODUCED GRATINGS

Alastair M. Glass, Rumson; Paul A. Kohl, Chatham; Richard M. Lum, Colts Neck, and Frederick W. Ostermayer, Jr., Berkeley Heights, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 20, 1984, Ser. No. 684,022
Int. Cl.⁴ C25F *3/12*
U.S. Cl. 204—129.3 **17 Claims**



1. A process for making a device comprising a pattern on a semiconductor surface in which said pattern is an optical grating consisting of an array of parallel lines of light with periodicity of less than 5.0 μm and is made by a procedure comprising the step of photoelectrochemically etching at least part of the surface of the semiconductor to produce oxidized species by passing current through the semiconductor, an electrolytic solution and a cathode, said electrolytic solution comprising an aqueous solution of at least one acid selected from the group consisting of HCl, HBr and H_2SO_4 with a total acid concentration ranging from 1 to 5 molar and a conductivity greater than 0.0001 mhos/cm in which the step further comprises:

a. applying a potential to the semiconductor between the maximum potential of the valence band of the semiconductor in the electrolytic solution and the minimum potential of the conduction band of the semiconductor in the electrolytic solution;

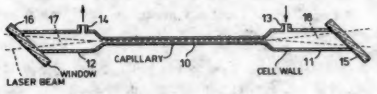
b. illuminating the part of the surface of the semiconductor to be etched with radiation of sufficient energy to produce holes in the valence band;

c. including in the composition of the electrolytic solution species which removes the oxidized species from the surface of the semiconductor.

4,622,115
PHOTOCHEMICAL PROCESS USING A WAVEGUIDE REACTION CELL

James A. O'Neill, 24 Mabelle Ave., Apt. 2707, Toronto, Ontario, Canada (M9A 4X8)

Filed Jun. 10, 1985, Ser. No. 743,084
Int. Cl.⁴ B01J *19/12*
U.S. Cl. 204—157.41 **4 Claims**



1. A process for inducing photochemical reactions in gases using laser radiation, which comprises:

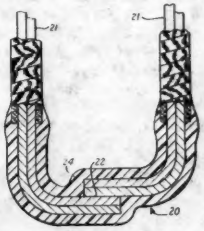
flowing the gas to be irradiated through an elongated passage of uniform cross section throughout its length, said passage having a wall of inert dielectric material, said passage communicating at its ends with a gas inlet chamber and a gas outlet chamber, respectively, focussing a beam of laser radiation onto said one end of the passage, and

propagating the radiation along the passage in one or more selected waveguide modes.

4,622,116
PROCESS FOR ELECTRODEPOSITING MICA ON COIL OR BAR CONNECTIONS AND RESULTING PRODUCTS

Richard K. Elton, Altamont, and William R. Schultz, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 702,525, Feb. 19, 1985, which is a continuation-in-part of Ser. No. 555,058, Nov. 25, 1983, abandoned. This application Jul. 5, 1985, Ser. No. 752,418
Int. Cl.⁴ C25D *13/16, 13/12*
U.S. Cl. 204—181.1 **4 Claims**



1. A process for providing a continuous insulating covering

on an electrical conductor, which process comprises the steps of:

wrapping a portion of the length of the conductor with porous mica tape;

immersing a bare unwrapped portion of the conductor and the adjacent wrapped portion thereof in an aqueous electrodeposition composition consisting essentially of 5–35% of particulated mica, 0.2–2% of a water soluble anionic resin binder as calculated in resin solids, 0.001–0.20% of an electrolyte, up to 0.3% of a non-ionic surfactant and a polar solvent;

electrodepositing said composition on the bare unwrapped portion of the conductor and the adjacent wrapped portion;

forming a continuous dry micaceous coating on the bare unwrapped and adjacent wrapped portions, said coating being porous and containing a sufficient amount of binder to hold mica particles together;

impregnating the porous coating with an impregnative resin varnish; and

subjecting the impregnated coating to an elevated temperature bake to cure the resin varnish.

4,622,117

SELF-CROSSLINKING, HEAT-CURABLE GRINDING RESIN

Michael Geist, Münster, and Günther Ott, Münster-Wolbeck, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 620,767, Jun. 14, 1984, Pat. No. 4,539,385. This application Feb. 7, 1985, Ser. No. 699,149

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322781

Int. Cl.[4] **C25D** *13/06;* **C08G** *59/14, 59/16*

U.S. Cl. 204—181.7 **12 Claims**

1. A method for the production of coatings comprising:

(a) reacting a polyglycidyl ester or a polyglycidyl ether with a compound which carries two groups which are reactive toward epoxide groups and at least one carboxylic ester group which is acitivated in the alcohol component by a substituent which has a negative inductive effect to give an intermediate possessing terminal epoxide groups;

(b) reacting said terminal epoxide groups with a salt of a tertiary amine/acid adduct with a ring opening taking place to form a resin binder;

(c) dispersing said resin binder in an aqueous electrocoating bath;

(d) partially neutralizing said aqueous electrocoating bath with an acid;

(e) immersing an electrically conductive substrate as a cathode in said aqueous electrocoating bath;

(f) depositing a film onto said substrate by means of direct current;

(g) removing said substrate from said bath; and

(h) baking said film to harden it.

4,622,118

METHOD AND APPARATUS FOR SEPARATING WAX/WATER FROM HYDROCARBON OIL MIXTURE BOILING IN THE LUBRICATING OIL RANGE

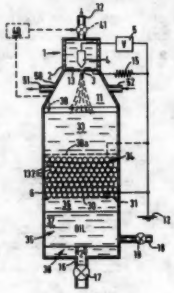
Robert J. L. Chimenti, Short Hills; Anthony E. Cerkanowicz, Livingston, and Douglas G. Ryan, Rockaway, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 11, 1985, Ser. No. 722,162

Int. Cl.[4] **B03C** *5/00*

U.S. Cl. 204—188 **26 Claims**

3. A method of enhancing separation of wax particles and/or water droplets from a hydrocarbon oil mixture boiling in the lubricating oil range, in which oil mixture the wax/water forms a dispersion, in which the wax particles and/or water droplets are grown in size, before being separated from the oil mixture, by introducing free excess electric charge which is net unipolar into a body of the wax/water-containing oil mixture which is devoid of any collector surfaces disposed inside said



body of oil mixture, and by allowing the introduced charge to induce said growth in size of wax particles and/or water droplets within said body of oil mixture.

4,622,119

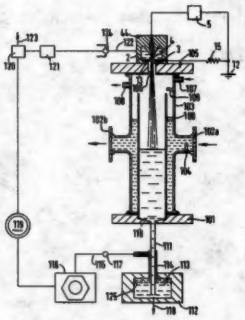
METHOD OF PROMOTING NUCLEATION OF SOLUTE IN A SOLUTION

Anthony E. Cerkanowicz, Livingston; Irving D. Crane, Randolph; Brian P. Flannery, Clinton, and Robert J. L. Chimenti, Short Hills, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 11, 1985, Ser. No. 722,107

Int. Cl.[4] **B03C** *5/00, 5/02;* **C10G** *33/02*

U.S. Cl. 204—190 **50 Claims**



1. A method of promoting nucleation of a solute, dissolved in a solvent to form a solution, so as to convert dissolved solute into a dispersed phase, comprising the steps of reducing the solubility for the solute and introducing free excess charge which is net unipolar into the solution, at least one of said steps being carried out from prior to nucleation taking place at least until nucleation of the solute in the charged solution takes place so as to produce said dispersed phase.

4,622,120

SPUTTERED INDIUM OXIDE FILMS

F. Howard Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 31, 1984, Ser. No. 575,604

Int. Cl.[4] **C23C** *15/00*

U.S. Cl. 204—192.26 **20 Claims**

1. In a method for depositing on a substrate multiple layer

films comprising at least one primary layer of a metal oxide and at least one primary layer of a metal other than the metal of the oxide layer, the improvement which comprises improving the adhesion between the metal oxide and metal layers by depositing between said layers an intermediate metal-containing layer having an affinity for both the metal and metal oxide layers.

17. An article of manufacture comprising a nonmetallic substrate, and deposited thereon in any order

a. at least one coating layer of metal;

b. at least one coating layer of an oxide of a metal other than the metal of the metal layer; and

c. deposited between said metal and metal oxide layers an intermediate metal-containing layer having an affinity for both the metal and metal oxide layers.

4,622,121

APPARATUS FOR COATING MATERIALS BY CATHODE SPUTTERING

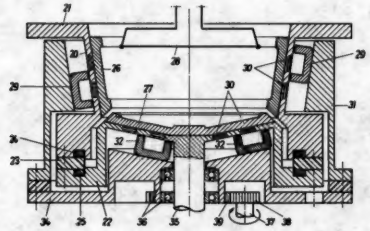
Urs Wegmann, Oberschan, Switzerland, and Eduard Rille, Dornbirn, Austria, assignors to Balzers Aktiengesellschaft, Liechtenstein, Liechtenstein

Filed Apr. 18, 1985, Ser. No. 725,016

Claims priority, application Switzerland, Apr. 19, 1984, 1970/84

Int. Cl.⁴ C23C *14/34*

U.S. Cl. 204—298 **13 Claims**



1. An apparatus for coating a material by cathode sputtering, comprising an anode, means defining a cathode in the form of a hollow cylindrical body having a cathode side wall which is open at one end and a closed end at its opposite end, said cathode being disposed adjacent to said anode, a material holder positioned adjacent said open end of said cathode, a first magnet system disposed around said cathode side wall for providing a first magnetic field influencing the formation of one sputtering zone on said cathode side wall, a second magnet system disposed adjacent said closed end for providing a second magnetic field influencing the formation of another sputtering zone on said closed end, and control means associated with said magnet systems for adjusting the proportion between said magnetic fields and thus between the sputtering performances in the sputtering zones.

4,622,122

PLANAR MAGNETRON CATHODE TARGET ASSEMBLY

Richard F. Landau, Londonderry, N.H., assignor to Oerlikon Buhrle U.S.A. Inc., New York, N.Y.

Filed Feb. 24, 1986, Ser. No. 832,082

Int. Cl.⁴ C23C *15/00*

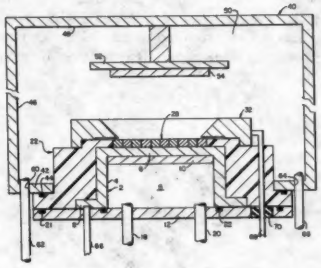
U.S. Cl. 204—298 **18 Claims**

1. A sputtering apparatus having a cathode assembly that comprises:

an electrically-conductive, non-magnetic member;

a target assembly engaging one portion of said electrically-conductive, non-magnetic member, said target assembly comprising a plurality of permanent magnets disposed in a predetermined array; and

a magnetic member engaging another portion of said electrically-conductive, non-magnetic member and spaced from



said target assembly by said electrically-conductive, non-magnetic member.

4,622,123

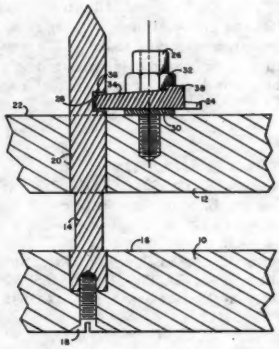
DEVICE FOR COMPRESSING A PAIR OF PLATES

Samuel Nejame, Jr., Medfield, MA, assignor to Ionics, Incorporated, Watertown, Mass.

Filed Jun. 17, 1985, Ser. No. 745,961

Int. Cl.⁴ B01D *13/02*

U.S. Cl. 204—299 R **5 Claims**



1. Means for compressing a pair of plates comprising in combination:

a. A post attached to and extending upright from the upper surface of the first of said plates and further extending through the second of said plates; and

b. A circular ramp member rotatably attached to the upper surface of the second of said plates, said ramp having an axis of rotation parallel to and offset from the axis of said post, said post having a slot for engaging said ramp whereby said post and said first plate are drawn toward said second plate upon rotation of said ramp.

4,622,124

DEVICE FOR HORIZONTAL ELECTROBLOTTING

John H. Kreisher, Ridgefield, and Thomas L. McCarthy, Cheshire, both of Conn., assignors to International Biotechnologies, Inc., New Haven, Conn.

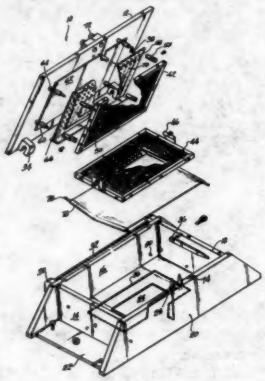
Filed Jan. 11, 1985, Ser. No. 690,649

Int. Cl.⁴ G01N *27/28*

U.S. Cl. 204—301 **10 Claims**

1. A device for the horizontal electroblotting of electrophoretically transferred material comprising a fluid tight container

having a floor, a lid and side wall means extending between said floor and said lid for defining a chamber, a support assembly located in said chamber for supporting the material to be electroblotted, a first electrode provided below said support assembly and a second electrode provided above said support assembly and means provided in said chamber between said first electrode and said support assembly for diverting bubbles



produced by said first electrode so as to prevent said bubbles from accumulating on said support assembly during the electroblotting of the electrophoretically transferred material wherein said means provided in said chamber between said first electrode and said support assembly comprises a membrane disposed in said chamber and spaced from said floor such that said membrane is disposed at an angle with respect to said floor.

4,622,125

OXYGEN CONCENTRATION CONTROL SYSTEM

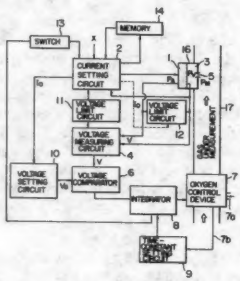
Yoshishige Oyama; Tadashi Kirisawa, both of Katsuta, and Minoru Osuga, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 483,173, Apr. 8, 1983, abandoned. This application Sep. 24, 1984, Ser. No. 653,550

Claims priority, application Japan, Apr. 12, 1982, 57-59676; Nov. 4, 1982, 57-192412

Int. Cl.[4] G01N *27/58*

U.S. Cl. 204—406 **12 Claims**



1. An oxygen concentration control system comprising:

an electrolyte of oxygen ion conductivity type, having one surface exposed to gases under measurement which are supplied thereto through a diffusion resistance member;

current supply means for continuously supplying to said electrolyte an electric current having a predetermined value corresponding to a selected oxygen concentration;

voltage detection means for detecting the voltage produced across said electrolyte by said electric current of predetermined value;

means for generating a predetermined reference voltage having a magnitude which resides within a range of values of said voltage detected by said voltage detection means between a predetermined lower limit and an upper limit where the electrolyte begins to pass into an electron conduction state;

means for reducing the current supplied to said electrolyte if said voltage detected by said voltage detection means is so large that electron conduction occurs; and

control means responsive to said detected voltage and said reference voltage for controlling the oxygen concentration of said gases under measurement to suppress a variation of said voltage detected by said voltage detection means when said detected voltage is of different value than said reference voltage.

4,622,126

ENGINE AIR/FUEL RATIO SENSING DEVICE

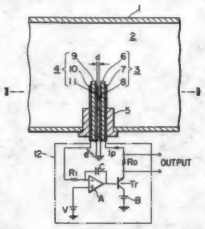
Setsuhiro Shimomura, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,495

Claims priority, application Japan, Sep. 17, 1983, 58-171588

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—425 **5 Claims**



1. An engine air/fuel sensing device comprising:

an air fuel sensor means having a gap portion for receiving an exhaust gas of said engine, a solid electrolyte oxygen pump cell for controlling an oxygen partial pressure within said gap portion, and a solid electrolyte oxygen sensor cell for producing an electromotive force corresponding to the difference between the oxygen partial pressure in the exhaust gas within said gap portion and the oxygen partial pressure in the exhaust gas outside said gap portion; and

control circuit means coupled to said sensor means including an input portion for comparing a predetermined reference voltage with the electromotive force to continuously provide an output until the electromotive force reaches the reference voltage, said input portion comprising an input resistor having one end connected to an electrode of said sensor cell, a differential amplifier having an inverting input connected to the other end of said input resistor and a non-inverting input connected to a source of said predetermined reference voltage, an output portion for driving a pump current through said oxygen pump cell in response to the output of said input portion, and means coupling said output to said input portion having a transfer function of an amplifier component plus an integrator component, whereby the air/fuel ratio of the engine is detected according to an output corresponding to the pump current, said coupling means including a feedback series circuit consisting of a feedback resistor and a feedback capacitor,

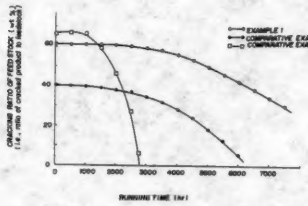
said feedback circuit being connected between the inverting input and the output of the differential amplifier.

4,622,127

METHOD FOR THE HYDROGENATION TREATMENT OF A HEAVY HYDROCARBON OIL

Yuji Noguchi, Sodegaura, and Yuzuru Itoh, Ichihara, both of Japan, assignors to Research Association for Residual Oil Processing, Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,365
Claims priority, application Japan, Apr. 16, 1984, 59-75028
Int. Cl.[4] C10G *47/16, 65/12*
U.S. Cl. 208—58 4 Claims



1. A method for the two-step catalytic hydrogenation treatment of a heavy hydrocarbon oil which comprises

first contacting the heavy hydrocarbon oil with a first solid catalyst comprising a metal component having catalytic activity for hydrogenation supported on a zeolite having cataytic activity for cracking a hydrocarbon, said zeolite having a (i) pore size distribution curve with two peaks, one peak in the range of 5 to 50 nm port diameter and the other peak in the range of 50 to 1000 nm pore diameter and (ii) the volume of the pores having a diameter of 100 nm or larger is at least 0.05 ml/g; whereby a hydrocracked product is formed; and

then contacting said hydrocracked product with second catalyst, said second catalyst being a catalyst having hydrogenation activity and which is different from said first catalyst, whereby a hydrogenated product is formed.

4,622,128

HYDROTREATING CATALYSTS COMPRISING SUPPORTED MIXTURES OF A SULFIDE OF TRIVALENT CHROMIUM AND MOLYBDENUM OR TUNGSTEN

Archie R. Young, Montclair; Teh C. Ho, Bridgewater; Allan J. Jacobson, Princeton, and Russell R. Chianelli, Somerville, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 28, 1984, Ser. No. 656,146
Int. Cl.[4] C10G *71/00, 45/04*
U.S. Cl. 208—18 26 Claims

1. A hydrocracking process comprising contacting a hydrocarbon feed at a temperature of at least about 100° C. and in the presence of hydrogen, with a catalyst obtained by compositing a quantity of inorganic refractory oxide support material and a hydrated oxide of trivalent chromium with one or more precursor salts and heating said composite at elevated temperature of at least about 150° C., in the presence of sulfur or sulfur bearing compound and under oxygen-free conditions for a time sufficient to form said catalyst, wherein said precursor salt contains a tetrathiometallate anion of Mo, W or mixture thereof and a cation comprising the conjugate acid of one or more neutral, nitrogen-containing ligands, L, at least one of which is a chelating polydentate ligand, wherein said feed contacts said catalyst for a time sufficient to hydrocrack at least a portion of said feed.

4,622,129

PROCESS FOR THE MANUFACTURE OF LUBRICATING BASE OILS

Gerhard G. Bayle, Amsterdam, Netherlands; Henricus M. J. Bijwaard, Le Petite Couronne, and Martinus M. P. Janssen, Grand Couronne, both of France, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 11, 1985, Ser. No. 786,786
Claims priority, application United Kingdom, Oct. 12, 1984, 8425837
Int. Cl.[4] C10G *67/04, 67/14*
U.S. Cl. 208—87 21 Claims

1. A process for the manufacture of lubricating base oils from nitrogen-containing distillate oil or a nitrogen-containing deasphalted oil by treating said oil to catalytic hydrotreatment in the presence of hydrogen and a catalytic composition of matter at catalytic hydrotreatment conditions in a catalytic hydrotreatment zone, passing said hydrotreated oil from said catalytic hydrotreatment zone to a dewaxing treatment zone and dewaxing said distillate oil or said deasphalted oil, wherein said oil which possesses a nitrogen content exceeding the value of (f) (P_{H2}) $(S_v)^{-1}$, wherein:

f=is equal to $2.15+0.12\ xV_{100}$ wherein V_{100} is equal to the kinematic viscosity of the resultant lubricating base oil expressed in centistokes (cSt) at 100° C.;

P_{H2}=is equal to the hydrogen partial pressure in bar existent in said catalytic hydrotreatment zone; and

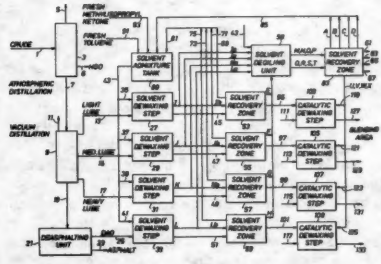
S_v=is equal to weight hourly space velocity in $t/m^3(h)$ in said catalytic hydrotreatment zone is subjected to solvent extraction prior to said hydrotreatment at severities sufficient to reduce said nitrogen content to a value less than said value of $(f)(P_{H2})(S_v)^{-1}$.

4,622,130

ECONOMIC COMBINATIVE SOLVENT AND CATALYTIC DEWAXING PROCESS EMPLOYING METHYLISOPROPYL KETONE AS THE SOLVENT AND A SILICATE-BASED CATALYST

Stephen C. Stem, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 9, 1985, Ser. No. 806,308
Int. Cl.[4] C10G *53/02*
U.S. Cl. 208—87 17 Claims



11. In a process for the combinative dewaxing of a lubricating oil having a wax content which comprises:

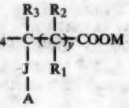
(a) contacting a waxy lubricating oil with a solvent comprising a ketone and an aromatic hydrocarbon selected from the group consisting of benzene, toluene, xylene and cumene in a solvent dewaxing zone, at solvent dewaxing conditions, to produce a partially dewaxed lubricating oil containing said ketone and said aromatic hydrocarbon and a slack wax stream containing hard wax, soft wax containing lubricating oil therewith, ketone, and aromatic hydrocarbon;

(b) passing said partially dewaxed lubricating oil and slack wax stream to a first separation zone, and separating therein said partially dewaxed lubricating oil from said slack wax stream;

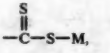
(c) removing said ketone and said aromatic hydrocarbon from said partially dewaxed lubricating oil and contacting said partially dewaxed lubricating oil with a dewaxing catalyst, in a catalytic dewaxing zone, at catalytic dewaxing conditions, to produce a dewaxed lubricating oil;
(d) treating, in a second dewaxing zone, said slack wax stream to separate said hard wax from said soft wax containing lubricating oil and said ketone solvent and said aromatic hydrocarbon from said slack wax stream;
(e) recycling at least a portion of said ketone and aromatic hydrocarbon from step (d) to said solvent dewaxing zone of step (a) or said second dewaxing zone of step (d); and
(f) passing said soft wax containing lubricating oil to a catalytic dewaxing zone to convert said soft wax and to thereby increase the produced quantity of lubricating oil; the improvement which consists of use of methylisopropyl ketone as said solvent ketone in the solvent dewaxing zone of step (a).

4,622,131
ORE FLOTATION
Clarence R. Bresson, and H. Wayne Mark, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Apr. 30, 1985, Ser. No. 728,910
Int. Cl.[4] B03D 1/06; C22B 3/00
U.S. Cl. 209—167 **20 Claims**

9. In a process for the recovery of copper values from an ore or concentrate containing same, wherein the values are recovered in a froth from an aqueous slurry containing the ore or concentrate, wherein a first depressant composition represented by the formula



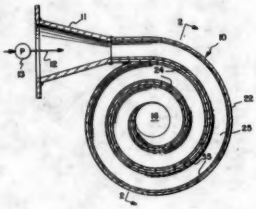
where M represents ammonium or Group IA metal; J represents S or NH; A represents



where M is as previously defined, or, provided that J=S, H or M as previously defined; R_1 and R_2 are selected from the group consisting of hydrogen and alkyl groups having 1–3 carbon atoms; R_3 and R_4 are selected from the group consisting of hydrogen, alkyl group having 1–3 carbon atoms, and COOM where M is as previously defined, and y is 0–7 is employed as a minerals depressant in the aqueous slurry to reduce the amount of certain depressed minerals in the froth, the improvement comprising employing a second depressant composition comprising a derivative of a thiocarbonate together with the first depressant composition in an amount sufficient to increase the copper values in the froth.

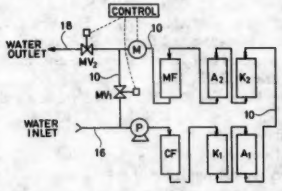
4,622,132
LIQUID CYCLONE OR CENTRIFUGAL CLEANER
David E. Chupka, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio
Filed Apr. 19, 1985, Ser. No. 725,171
Int. Cl.[4] B04C 3/00, 5/103
U.S. Cl. 209—211 **10 Claims**

1. A cleaner for treating a liquid suspension of mixed relatively heavy and light particles to separate said relatively heavy and light particles from each other, comprising:
(a) a top plate,
(b) a bottom plate having a substantially centrally located outlet port therein,
(c) a spiral wall including an outer portion cooperating with said plates to form the outer wall of said cleaner and also including a plurality of turns within said outer wall portion and cooperating therewith to define a spiral passage having a corresponding plurality of turns with the inner end thereof communicating directly with said outlet port,
(d) means defining an inlet port leading into the outer end of said spiral passage for receiving the suspension to be treated,
(e) whereby said suspension is caused to travel through said



spiral passage to said inner end thereof and thereby to develop centrifugal force causing heavy particles therein to follow the radially outer wall of said passage to said outlet port,
(f) means forming a second substantially centrally located outlet port through one of said plates for receiving the balance of said suspension including the relatively light particles therein, and
(g) said portion of said spiral wall within said outer portion being of lesser height than said outer portion to provide space between the top thereof and said top plate through which said balance of the suspension can flow to said second outlet port.

4,622,133
WATER-DEIONIZING SYSTEM
Nobuo Furuno, Amagasaki, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Feb. 5, 1986, Ser. No. 826,460
Claims priority, application Japan, Feb. 6, 1985, 60-022285
Int. Cl.[4] C02F 9/00
U.S. Cl. 210—96.2 **8 Claims**



1. A system for producing deionized water comprising:
at least a pair of a cation exchanger unit and an anion exchanger unit connected in series;
closed-loop flow path means for circulating a batch of water within said system through said ion exchanger units;
pumping means associated with said flow path means for repeatedly circulating said batch of water within the system in a predetermined direction;
sensor means for sensing the specific conductivity of water flowing through said flow path means at a location immediately downstream said ion exchanger units;
first valving means for selectively shutting off the flow of

water through said flow path means at a location between said sensor means and said ion exchanger units;

inlet means merging with said flow path means at a location between said first valving means and said ion exchanger units for intermittently introducing raw water to the system;

outlet means branching from said flow path means at a location between said sensor means and said first valving means for intermittently discharging product water from the system;

second valving means associated with said outlet means; and

control means responsive to the level of the specific conductivity sensed by said sensor means for controlling the operation of the system between

(a) a first mode in which said batch of water is repeatedly circulated within the system with said first valving means open while said second valving means closed until said specific conductivity sensed by said sensor means is less than a first predetermined level, and

(b) a second mode in which said batch of water is discharged from the system through said outlet means and simultaneously another batch of raw water is introduced into the system through said inlet means with said first valving means closed while said second valving means open until the specific conductivity sensed by said sensor means is greater than a second predetermined level which is higher than said first predetermined level.

4,622,134

APPARATUS FOR TREATING SEWAGE

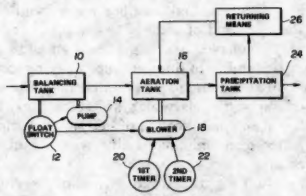
Hidenori Kobayashi, 4-383, Tokoji-cho, Kofu-shi, Yamanashi-ken, Japan

Filed Oct. 24, 1984, Ser. No. 664,272

Claims priority, application Japan, Oct. 25, 1983, 58-199665; Oct. 25, 1983, 58-199666

Int. Cl.[4] C02F *3/20*

U.S. Cl. 210—127 **5 Claims**



1. An apparatus for treating sewage, comprising:

a balancing tank having a bottom side and a top side, said balancing tank for receiving sewage sent from a sewage source;

a first float switch at a lower sewage level in the balancing tank;

a second float switch at a higher sewage level in the balancing tank;

a plurality of pumps in the balancing tank near the bottom side, one pump being connected to said first switch and the other pump being connected to said second switch for operation thereby;

an aeration tank having a bottom side and a top side connected to and located downstream of the balancing tank for receiving sewage therefrom conveyed by said pumps;

a plurality of interconnected blowers having conduit means to the interior of the aeration tank for supplying air to the sewage therein;

said blowers having connection means to said switches for actuation thereby;

a precipitation tank connected to and located downstream of the aeration tank for receiving aerated sewage sent from the aeration tank, said precipitation tank causing sludge present in the sewage to settle whereby resultant supernatant liquid in the sewage may be removed;

means in the precipitation tank for returning settled sludge to the aeration tank;

a first timer means connected to said first float switch and to one of said blowers and having means to continue operation of said blower to prolong operation thereof for a predetermined period after said first float switch is turned off; and

a second timer means connected to said blowers independently of said switches and having means to periodically operate at least one of said blowers for predetermined periods of time in the absence of sewage flow into the aeration tank.

3. An apparatus for treating sewage, comprising:

an aeration tank for receiving sewage from a sewage source;

conduit means connected to said aeration tank for conveying said sewage from the source to the aeration tank;

stopper means in said conduit at its discharge end and a centrally recessed triangular opening therein for permitting flow of sewage therethrough;

a plurality of vertically arranged sensor means on said stopper means to detect flow rate of the sewage transmitted in said conduit and passing through said opening;

a plurality of interconnected blowers having conduit means to the interior of said aeration tank for supplying air to the sewage therein;

said plurality of sensors and said plurality of blowers interconnected by electric switch curcuits and controlled thereby in such a manner that no blower is actuated when sewage flow rate is below a perdetermiend minimum flow level while all of the blowers are actuated in succession as flow rate increases to a predetermined maximum flow level where all blowers are actuated;

a precipitation tank connected to and located downstream of the aeration tank for receiving the aerated sewage sent from the aeration tank, said precipitation tank causing sludge present in the sewage to settle whereby supernatant liquid may be removed therefrom; and

means associated with said precipitation tank and connected to said aeration tank for returning the sludge therein to the aeration tank.

4,622,135

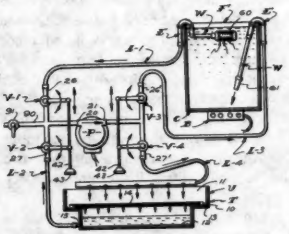
GREASE FILTERING APPARATUS

Calvin Williams, 1156 W. 65th St., Inglewood, Calif. 90302

Filed Oct. 29, 1984, Ser. No. 665,556

Int. Cl.[4] B01D *29/04*

U.S. Cl. 210—167 **10 Claims**



1. An oil filtering machine for use in combination with a deep fryer unit having an upwardly opening cooking vessel containing a supply of hot cooking oil, said machine includes a filter unit comprising a vertically extending tank and a filter panel in the tank spaced above the bottom thereof, a liquid circulating system including a motor driven pump with an inlet and an outlet, an oil inlet system including an elongate oil conducting first suction line with an upstream end extending to and communicating with the cooking vessel, an elongate oil

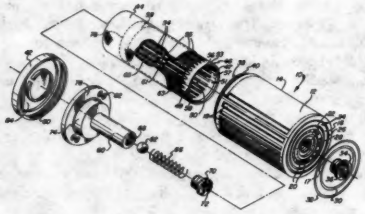
conducting second suction line with an upstream end communicating with the tank below the filter panel, adjustable first valve means connected with and between the inlet of the pump and the downstream ends of said first and second suction lines and operating to proportionally vary the flow rate and volume of oil moving from the vessel and tank through the suction lines to the pump, an oil outlet system including an elongate oil conducting first delivery line with a downstream end extending to and communicating with the cooking vessel and an elongate oil conducting second delivery line with a downstream end communicating with the tank above the filter panel, an adjustable second valve means connected with and between the outlet of the pump and the upstream ends of said first and second delivery lines and operating to proportionally vary the flow rate and volume of oil moving from the pump through the delivery lines and to said vessel and tank.

4,622,136

REUSABLE LIQUID FILTER ASSEMBLY

Jon Karcey, Makawao, Hi., assignor to Watson Karcey International, Greenwich, Conn.

Filed Aug. 23, 1985, Ser. No. 769,859
Int. Cl.[4] B01D *29/04*
U.S. Cl. 210—168 **17 Claims**



1. An automotive filter assembly comprising: means for use with an internal combustion engine, said assembly including means enabling cleaning for reuse, including,

(a) a housing having a sidewall and an endwall, the housing having at least one liquid inlet port for receiving liquid to be filtered and at least one liquid outlet port for discharging filtered liquid;

(b) filter means removably mounted inside the housing, the filter means being positioned between the inlet port and the outlet port, the filter means being adapted to filter the liquid passing from the inlet port to the outlet port, said filter means including means for enabling cleaning for reuse a substantial number of times;

(c) means for holding the filter means inside the housing, the holding means comprising a hollow cylinder having tapered lengthwise slots for permitting the passage of liquid from the inlet port through the filter means to the outlet port;

(d) valve means in liquid communication with the inlet port and the outlet port, the valve means being responsive to pressure of the liquid entering through the inlet port to provide a passageway from the inlet port to the outlet port when the pressure exceeds a predetermined value; and

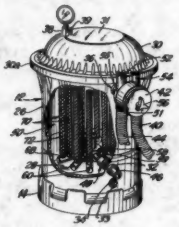
(e) removable means for alternately sealing and opening the housing to permit the removal of the filter means, the holding means, and the valve means, said sealing means including means enabling removal thereof, said filter means including means enabling removal for inspection, cleansing and reuse a substantial number of times.

4,622,137

FILTERING SYSTEM FOR SWIMMING POOLS, WITH REMOVABLE MANIFOLD ASSEMBLY AND BRAIDED FILTER GRID UNITS

Emerich Kessler, 28 Lakeview Dr., West Orange, N.J. 07052

Filed Nov. 13, 1985, Ser. No. 797,456
Int. Cl.[4] B01D *29/24*
U.S. Cl. 210—169 **8 Claims**



1. A filtering system by which fluid containing particulate matter suspended therein may be clarified by separating the particulate matter from the fluid, the filtering system comprising:

a vessel having a base, a side wall, an open upper end, an inlet port in an upper end of the side wall of said vessel for receiving said fluid to be filtered, and an outlet port in a lower end of the side wall of said vessel for discharging filtered fluid;

a filter grid unit and manifold assembly removably positioned on the base of said vessel and comprising a central manifold having a hollow hub and a plurality of hollow support arms and a hollow conduit arm extending radially from, and symmetrically about, said hub in a plane perpendicular to the longitudinal axis of said manifold, said conduit arm being open at both ends and said support arms being open at one end, an open end of said conduit arm and the open end of each of said support arms being removably connected to said hub, each of said support arms having a plurality of filter grid units having threaded ends removably connected to a plurality of threaded openings in said support arms which are spaced apart from one another in an upper portion of said support arms and align said filter grid units vertically within said vessel and spaced apart from one another;

each of said filter grid units comprised of a perforated tubular support frame open at both ends and having a rigid non-flexible side wall, the perforations being large enough to pass unfiltered fluid therethrough, and a flexible outer sleeve encasing said tubular support frame, said outer sleeve formed of a synthetic plastic fiber braided or woven into a tubular shape and having a multiplicity of interstices therein which pass fluid therethrough but are small enough to prevent diatomaceous earth particles from passing through, said outer sleeve being tightly wrapped over, and sealed at both ends to said inner support frame providing a rigid unitary structure therewith, said outer sleeve being open at one end and adapted at said open end to thread into an opening in one of said support arms, and said outer sleeve being closed at its other end;

means communicating said vessel outlet with the open end of said conduit arm of said central manifold which is not connected to said hub;

pump means and associated conduit lines for causing fluid to flow into and out of said vessel and to first and second outlet lines;

valve means and associated conduit lines for controlling flow of fluid into and out of said vessel and through said filter grid unit and manifold assembly into said first or second outlet lines and for controlling flow of fluid, by-

passing said vessel, into said first or said second outlet line; and

means separate from said vessel and said filter grid unit and manifold assembly for providing a seal-tight cover for the upper end of said vessel.

4,622,138

VERTICAL DRAIN

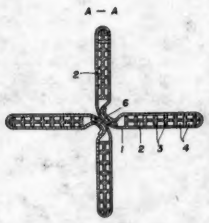
Oleg Wager, Koltrastvagen 43, S-161 37 Bromma, Sweden

Filed Dec. 5, 1984, Ser. No. 678,337

Claims priority, application Sweden, Mar. 9, 1984, 8401322

Int. Cl.[4] B01D *29/04;* E02B *11/00*

U.S. Cl. 210—170 **3 Claims**



1. A prefabricated vertical drain for dewatering saturated soil, said drain comprising two elongated bands joined to open and form at least a partial cross-shaped cross section, each of said bands having a core covered by a filter fabric, each of said cores having a plurality of longitudinal channels intersected by transverse channels extending perpendicular thereto, the fabric of said two bands being longitudinally joined together so that said bands may be folded together or spread apart, said spread bands being shaped so that they may be installed with at least two sides set an an angle to catch water flowing radially into the drain, said bands folded together having a rectangular cross section so that they may be rolled up for storage.

4,622,139

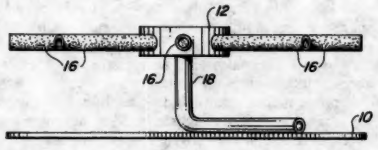
AERATOR DEVICE

Charles J. Brown, 4877 Woodland Cir., Tallahassee, Fla. 32303

Filed Mar. 20, 1985, Ser. No. 714,118

Int. Cl.[4] C02F *7/00*

U.S. Cl. 210—170 **14 Claims**



1. Apparatus for aerating a liquid comprising:

a manifold having an input connector for receiving positive pressure air and a plurality of output connectors for even distribution of the air, said manifold comprising a substantially flat plate-like assembly having said output connectors uniformly distributed about a periphery thereof;

a plurality of rigid elongated diffuser tubes, each having an open end and a closed end, the open end of each tube being connected to a corresponding one of the output connectors of said manifold, said tubes being arranged and dimensioned to create an upwelling turbulent flow without downward flow in an area coextensive with said tubes;

a base plate; and

support means connected to said base plate and said manifold for positioning said manifold a predetermined distance from said base plate, said distance being selected such that laminar liquid flow entering an area between said diffuser tubes and said base plate is not turbulent.

8. In a body of water having substantial loose bottom sediment, apparatus for rapidly introducing dissolved oxygen into the water by direct air contact without disturbing the sediment, the apparatus comprising:

a base plate;

a substantially flat plate-like manifold having a centrally located air input connector and a plurality of peripherally located, evenly spaced air output connectors;

a plurality of rigid microporous diffuser tubes, each having an open end and a closed end, the open end of each tube being connected to a corresponding one of the output connectors of said manifold; and

means for supporting said manifold a predetermined distance above said base plate whereby positioning said base plate upon the sediment within the water maintains said diffuser tubes above the sediment level.

4,622,140

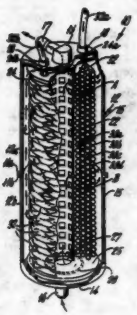
DEVICE USEFUL IN THE TREATMENT OF BLOOD

Kyu H. Lee, King of Prussia, and Christopher H. Porter, Newtown Square, both of Pa., assignors to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Division of Ser. No. 21,373, Mar. 19, 1974, abandoned. This application Oct. 30, 1980, Ser. No. 202,392

Int. Cl.[4] B01D *17/00;* B01N *43/00*

U.S. Cl. 210—177 **33 Claims**



1. A device useful in the treatment of blood, said device comprising:

(a) a casing having a hollow interior, a top end, a bottom end, a side wall having an inner surface, a first inlet means, a first outlet means, a second inlet means, and a second outlet means,

(b) a core comprising an upstanding side wall having an outer surface, said core being located within said casing and defining means for permitting a fluid flowing into said casing through said first inlet means to flow out of said casing through said first outlet means,

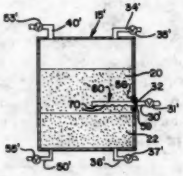
(c) a length of non-semipermeable tubing having a first end and a second end, the first end of the tubing being connected to said second inlet means and the second end of the tubing being connected to said second outlet means, said tubing having spacing means on the outer surface thereof, the portion of said tubing intermediate its first and second ends being wrapped generally circumferentially around the outer surface of the side wall of said core for substantially the entire length of said core to provide at least one layer of coiled tubing within said casing, and

(d) means for permitting said fluid flowing into said casing through said first inlet to contact the outer surface of said at least one layer of coiled tubing.

4,622,141
METHOD AND APPARATUS FOR WITHDRAWING A LAYER OF MATERIAL FROM A VESSEL

Eli Salem, Deal; Raymond J. Muller, Westfield, and Stanley T. Stracey, Springfield, all of N.J., assignors to The Graver Company, Union, N.J.

Filed Oct. 29, 1984, Ser. No. 665,560
Int. Cl.[4] B03B *5/64*; B01J *49/00*
U.S. Cl. 210—189 **14 Claims**



1. An apparatus for holding exhausted cation resin particles along with less dense anion resin particles in substantially separate layers and for removing at least some of the resin particles from at least said anion resin particle layer to a location exterior of said vessel, said apparatus including:

a vessel for containing a layer of said cation resin paricles in a cation zone at the bottom of said vessel and for containing a layer of said anion resin particles in an anion zone above said cation zone;

inlet means to said vessel for introducing said anion and cation resin particles into said vessel;

means for effecting a flow of fluid through said resin particles to stratify said resin particles in said layers;

an elongate withdrawal conduit for discharging said anion resin particles from said anion particle layer through a wall of said vessel to the exterior of said vessel, said conduit projecting into said vessel above the bottom of the vessel and being substantially horizontally disposed at an elevation above and substantially parallel to said layer of cation resin particles, said conduit defining an exit port at the wall of said vessel for accommodating the discharge of said anion resin particles out of said vessel, the interior of said conduit defining within said vessel a flow passageway extending from said exit port to the end of the conduit within said vessel, and said conduit also defining at least one downwardly opening resin particle withdrawal aperture with the uppermost portion of any said resin particle withdrawal aperture being lower than the uppermost portion of said resin particle exit port; and

means for introducing a fluid into said vessel to move resin particles from said anion resin particle layer into and through said conduit via said withdrawal aperture.

4,622,142
FILTER DEVICE

Masahiro Teranishi, Aichi, Japan, assignor to Kabushika Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1985, Ser. No. 759,343
Claims priority, application Japan, Aug. 16, 1984, 59-170876; Sep. 28, 1984, 59-204214; Oct. 30, 1984, 59-228478
Int. Cl.[4] B01D *25/04, 35/00*
U.S. Cl. 210—238 **20 Claims**

1. A filter device comprising: A means designed for preventing discoloration of washed articles by filtering impurities, such as iron oxide powder and other foreign matter contained in a water supply to a washing machine wherein washed articles are rinsed as water is supplied, including,

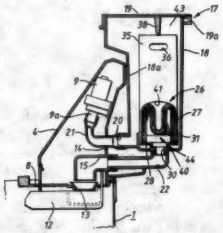
a container having an open top end, a bottom surface which includes a water outlet port, a water inlet port defined in the container and an overflow port, said water inlet, outlet and overflow ports being in communication with the ambient air;

filter assembly means including a filter medium housed in the container for partitioning the interior of the container into an intake chamber for receiving water from the water supply and a discharge chamber for receiving filtered water which has flowed through said filter medium, said intake chamber including the water inlet port and said discharge chamber including the water outlet port;

means defining an overflow passage extending to a predetermined height above said bottom surface and having an overflow entrance located in the intake chamber to establish a maximum water level in said container, said overflow passage including said overflow port and being in fluid communication with the intake chamber and the ambient air through said overflow port; and

a lid member for closing the top end of the container.

19. A filter device comprising: A means designed for preventing discoloration of washed articles by filtering impurities, such as iron oxide powder and other foreign matter, from a water supply including,



container means having a bottom wall defining an outlet port and opposing pairs of side walls to thereby establish an open top opposite said bottom wall for containing a predetermined volume of water therein, said container means further having an inlet port to permit introduction of water from the supply into said container means;

filtration means for filtering impurities from the water;

support means for supporting said filtration means within said container means so that said filtration means separates said container means into an upper intake chamber and a lower discharge chamber, said support means including a discharge port establishing fluid communication between said lower discharge chamber to said discharge port to thereby transfer filtered water from said discharge chamber;

spacer means for establishing a defined space between said support means and said bottom wall;

said support means also including an integral hinge means for permitting flexible displacement of said support means in response to distension of said filtration means during the filtration of water.

4,622,143
DOUBLE-ENDED HOLLOW FIBER PERMEATOR

Donald W. Edwards, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

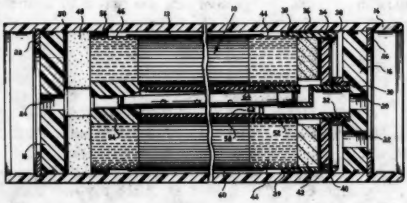
Filed Jul. 2, 1985, Ser. No. 751,142
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—321.1 **7 Claims**

1. In a permeator including an elongated casing and a perforated first tube within an encased bundle of hollow fibers having a tube sheet at each end thereof, the improvement comprising provision of an imperforate second tube within said first tube, an adaptor at one end of the bundle and a bushing within the tube sheet at the other end of the bundle,

said fibers having open ends embedded in said tube sheets, said casing having first and second ports at one end thereof

and a third port at the other end, the open ends of said fibers at said other end of the bundle being in communication with said third port,

said adaptor being a connector having a first passage in communication with said first port and with said first tube and a second passage in communication with the open



ends of said fibers at said one end of the bundle and with said second tube, said second tube extending into said bushing and being in communication therethrough with said third port, the open ends of said fibers at said other end of the bundle also being in communication with said third port and there being a flow path through said bundle between the perforated first tube and said second port.

4,622,144

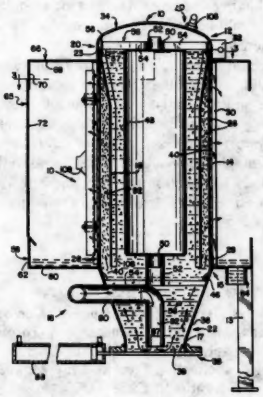
PRESSURE FILTER APPARATUS

Louis Janecek, Southfield, and Richard H. Wykoff, Livonia, both of Mich., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Continuation of Ser. No. 367,444, Apr. 12, 1982, abandoned. This application Jun. 21, 1984, Ser. No. 622,976

Int. Cl.[4] B01D *23/06*

U.S. Cl. 210—351 **6 Claims**



1. A filter device for separating suspended solids from a liquid suspension, said filter device comprising a pressure vessel having a top and a bottom, an upstanding porous filter section for separating suspended solids from a liquid suspension in said vessel, a fluid impervious and flexible curtain suspended in said vessel in contact on both of its sides with said liquid suspension in normally spaced relationship from said filter section to permit fluid flow therethrough, inlet means communicating with said vessel for introducing said liquid suspension into said vessel to thereby separate said suspended solids from said liquid suspension, pneumatic pressure inlet means connected to one end of said vessel for introducing pneumatic pressure directly into said pressure vessel at a pressure in excess of atmospheric pressure above said liquid suspension and into direct contact therewith on one side of said impervious flexible curtain when liquid flow into said vessel is shut off, said pneumatic pressure inlet means being operative to cause continued flow through solids accumulated on said filter section so as to gradually lower liquid level in said vessel until said liquid level is below said filter section and causing said flexible curtain to conform to said filter section and compress the accumulated solids which are disposed above the liquid suspension as said liquid level drops to extract additional liquid from said solids.

4,622,145

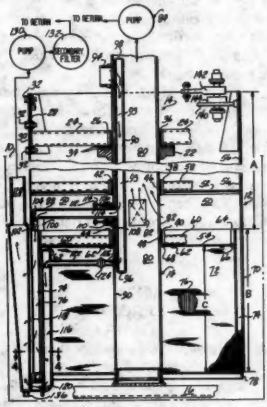
DRUM FILTER

Jack R. Bratten, 5970 St. James Dr., West Bloomfield, Mich. 48033

Continuation-in-part of Ser. No. 444,970, Nov. 29, 1982, abandoned. This application Aug. 4, 1983, Ser. No. 520,184

Int. Cl.[4] B01D *33/08*

U.S. Cl. 210—404 **30 Claims**



1. A drum filter comprising:

a tank adapted to receive a quantity of liquid to be filtered from a source;

a filter disposed in said tank, said filter comprising a drum member having a central axis disposed vertically in said tank and having a filtering section comprised of an annular array of parallel axially extending passages defined in part by a plurality of circumferentially spaced partitions having radially spaced outside and inside edges and outside and inside filter media layers disposed over the outside and inside partition edges said drum being open ended at its lower end disposed in said tank respectively;

means for drawing liquid in said tank into said passages through both said outside and inside filter media layers simultaneously; and,

means for collecting filtered liquid drawn into said passages for return to said source;

means for dislodging contaminants built up on each of said outside and inside filter media layers to clean said filter media layers and means for collecting contaminants dislodged by said means, whereby dislodged contaminants from said inside media layer can settle out through said open end of said drum member.

4,622,146

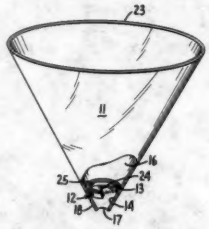
FLEXIBLE PAINT STRAINER

Robert O'Brien, 2326 Hillgard Ave., Berkeley, Calif. 94709

Continuation of Ser. No. 517,211, Jul. 25, 1983, abandoned. This application Aug. 6, 1985, Ser. No. 763,316

Int. Cl.[4] B01D *25/04*

U.S. Cl. 210—469 **8 Claims**



1. A disposable paint strainer, comprising a sleeve of limp, flexible readily deformable material impermeable to paint and thin enough to be folded flat and secured by a rubber band when not in use for straining and a flexible, readily deformable, paint straining perforate element chemically bonded and secured continuously around its periphery to the inner surface of said sleeve with the portion of the sleeve above said perforate element defining with said perforate element a pocket for receiving the paint to be strained,

said sleeve being formed for manual gripping together at its top and manual squeezing to force paint from said pocket out through the bottom end of said sleeve,

said perforate element being positioned in spaced relation to the end of said sleeve opposite to said pocket so as to cause said sleeve to provide a skirt extending below said perforate element for keeping the hands of the user from contacting paint forced through said paint straining perforate element.

4,622,147

PLANT FOR THE ANAEROBIC PURIFICATION OF WASTE WATER

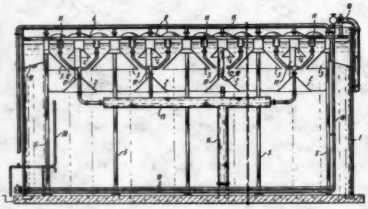
Sjoerd H. J. Vellinga, Wommels, Netherlands, assignor to Paques B.V., Balk, Netherlands

Filed Mar. 3, 1986, Ser. No. 835,794

Claims priority, application Netherlands, Mar. 6, 1985, 8500634

Int. Cl.[4] B01D *21/02*

U.S. Cl. 210—539 **4 Claims**



1. Plant for the anaerobic purification of waste water comprising a reactor tank with a settler disposed above a fermentation chamber, the settler being formed by at least two levels of gas-collection hoods which are sited in an overlapping manner such that the gas bubbles rising up out of the fermentation chamber are always collected, means for the discharge of purified water disposed above the gas collection hoods, and means for the supply of waste water to the fermentation chamber, characterized in that the settler consists of three levels of gas-collection hoods (2, 3, 4), each gas-collection hood of the uppermost level (4) being sited directly above a gas-collection hood of the lowermost level (2), in that each gas-collection hood of the lowermost layer (2) is connected via one or more pipes to a gas-collection hood of the uppermost level (4), and in that the gas-collection hoods of the uppermost and middle level (4 and 3 respectively) have a direct connection to the gas discharge line (15).

4,622,148

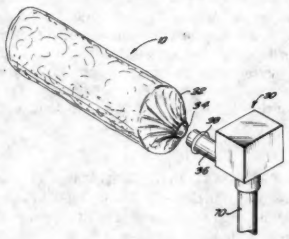
AQUARIUM FILTER SYSTEM

Allan H. Willinger, Franklin Lakes, N.J., assignor to Willinger Bros., Inc., Englewood, N.J.

Filed Jun. 25, 1985, Ser. No. 748,522

Int. Cl.[4] C02F *3/04, 3/06;* **A01K** *63/04*

U.S. Cl. 210—615 **18 Claims**



12. A process for filtration, decontamination and aeration of aquarium water which comprises:

(a) feeding contaminated aquarium water into an enclosed receptacle, a wall of which is formed of stretchable filter material having enlargeable interstices defining water passages from the interior of said receptacle to the exterior surface thereof;

(b) exposing said receptacle to the atmosphere whereby the contaminating material is retained in the interior of the receptacle and is aerated by exposure to the atmosphere upon emergence therefrom, the stretchable material providing support surfaces for the proliferation of aerobic bacteria whereby the bacteria are exposed to the contaminating material for action thereon; and

(c) redirecting the treated water into the aquarium tank.

4,622,149

EFFLUENT TREATMENT

Eric A. P. Devuyst, Toronto, and Bruce R. Conard, Oakville, both of Canada, assignors to Inco Limited, Toronto, Canada

Filed Apr. 29, 1985, Ser. No. 728,335

Claims priority, application Canada, May 23, 1984, 454880

Int. Cl.[4] C02F *1/52*

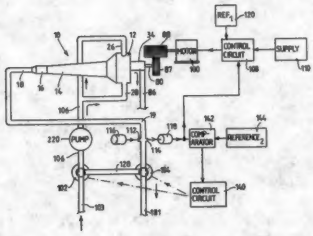
U.S. Cl. 210—717 **5 Claims**

1. A process for removing arsenic, antimony and cyanide from aqueous effluent containing same comprising adding effective ferric ion in aqueous solution to said aqueous effluent at a pH of about 5 to 9 in an amount of at least about three times the total weight of said arsenic and said antimony to precipitate arsenic and antimony in occlusion association with precipitated ferric hydroxide, reacting cyanide in said effluent solution with sulfur dioxide and oxygen in the presence of soluble copper catalyst at a pH of about 5 to about 11 to remove said cyanide from said effluent and thereafter separating said precipitated ferric hydroxide containing said arsenic and antimony from said aqueous effluent.

4,622,150
OVERFLOW OUTLET FOR A CYCLONE SEPARATOR AND METHOD OF OPERATION

Noel Carroll, Sherbrooke Road, Sherbrooke 3789, Victoria, Australia

PCT No. PCT/AU84/00097, § 371 Date Jan. 28, 1985, § 102(e) Date Jan. 28, 1985, PCT Pub. No. WO84/04702, PCT Pub. Date Dec. 6, 1984
PCT Filed Jun. 1, 1984, Ser. No. 705,431
Claims priority, application Australia, Jun. 1, 1983, PF 9646/83
Int. Cl.[4] B01D *21/26*
U.S. Cl. 210—739 18 Claims



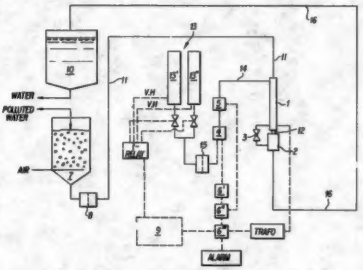
1. A cyclone separator for separating liquid components in a liquid mixture and having an elongate tapered separating chamber with at least one side inlet for liquid to be separated and an overflow outlet opening at a larger cross-sectional end of the separating chamber, for outflow of the less dense of said components, the separating chambr also having an underflow outlet at the smaller cross-sectional end of the separating chamber, for outflow of the denser of said components, and valve means operable to effect variable restriction of flow from the separator via said overflow outlet opening, said separator having a control system coupled to said valve means to effect said variable restriction of flow, the control system including a contaminant sensor positioned exteriorly of said separating chamber to receive and monitor the level of contamination of the denser of said separated components, emerging from said underflow outlet, by presence of the less dense component therein, said system varying said restriction to flow from the overflow outlet in accordance with variations in said measured level of contamination, whereby to tend to minimize said level of contamination.

14. A method of controlling a cyclone separator separating liquid components in a liquid mixture and having an elongate tapered separating chamber with at least one side inlet for liquid to be separated and an overflow outlet opening at a larger cross-sectional end of the separating chamber, for outflow of the less dense of said components, the separating chamber also having an underflow outlet at the smaller cross-sectional end of the separating chamber, for outflow of the denser of said components, and valve means operable to effect variable restriction of flow from the separator via said overflow outlet opening, the method comprising measuring, by the use of a contaminant sensor positioned exteriorly of said separating chamber, the level of contamination of the denser of said separated components, emerging from said underflow outlet, by presence of the less dense component therein, and operating said valve means to effect said variable restriction of flow the overflow outlet in accordance with variation in said measured level of contamination, whereby to tend to minimize the level of contamination.

4,622,151
METHOD AND DEVICE FOR OZONIZATION OF A FLUID

Peter Hiltebrand, Blumenau 7, 8184 Bachenbulach; Arthur Ruf, Im Zimikerriet 8, 8603 Schwerzenbach; H. E. Laederach, Kranichweg 30, 3074 Muri, and K. Gschwend, En Abbaye, 1891 Verossaz, all of Switzerland

PCT No. PCT/CH84/00039, § 371 Date Nov. 16, 1984, § 102(e) Date Jan. 4, 1985, PCT Pub. No. WO84/03693, PCT Pub. Date Sep. 27, 1984
PCT Filed Mar. 14, 1984, Ser. No. 682,050
Claims priority, application Switzerland, Mar. 19, 1983, 1487/83
Int. Cl.[4] C02F *1/78*
U.S. Cl. 210—739 5 Claims



1. In an ozonizer having gapped electrodes for producing an ozone-bearing gas for treating a fluid, wherein said ozone-bearing gas is produced from an input gas into said ozonizer by means of electrical spark discharge between said electrodes, and wherein said ozonizer is cooled by the fluid to be treated: the method of monitoring the relative humidity and gas throughput of the input gas before its entry into the ozonizer, interrupting the operating current to the electrodes to prevent destruction of the ozonizer when the relative humidity of the input gas exceeds a nominal value beyond which water condensation occurs on the electrode surfaces narrowing the electrode gap with resulting local high-energy spark discharge or short-circuiting of the electrodes; and interrupting the operating current to the electrodes when throughput of the input gas is less than the requirement for the production of such ozone-bearing gas.

4,622,152
COMBINED MIXING, REACTING, DRYING AND FILTERING DEVICE

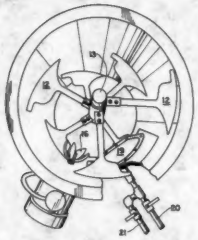
Thomas A. Resing, Fort Wright, Ky., and George L. Ely, Cincinnati, Ohio, assignors to Littleford Bros., Inc., Florence, Ky.

Continuation-in-part of Ser. No. 559,629, Dec. 8, 1983, abandoned. This application May 9, 1985, Ser. No. 732,261
Int. Cl.[4] B01D *35/00*
U.S. Cl. 210—769 19 Claims

1. In a mixing, reacting process including the steps of creating a liquid-solids slurry batch of material in a mixing, reacting chamber and subjecting said slurry batch to a positive mix action in said chamber by means of a positive-action mixing element, the improvement which includes the steps of: continuously presenting said liquid-solids slurry batch to a filter device located in said chamber as the viscosity of said slurry batch increases due to increasing particle or solids concentration, the filter device being proximally located with respect to the positive-action mixing element; continuously filtering liquid from said liquid-solids slurry batch and accumulating such liquid in said chamber device while said slurry batch is subjected to said positive mix action in said chamber; periodically removing solids which accumulate on said filter device while

said solids remain in said chamber; removing any skin which forms on said solids by the mechanical mixing action of the slurry on the filter device while said solids remain in said chamber; withdrawing liquid accumulating in said filter device; and ensuring that the successive processing steps of mixing, reacting, filtering and drying said liquid-solids slurry batch are completed in said chamber without discharging said slurry batch from said chamber; whereby said liquid-solids slurry batch is reduced to a friable particulate condition while still in said chamber.

5. In a mixing, reacting unit comprised of a mixing, reacting chamber and a positive-action mixing element located within said chamber, said positive-action mixing element being movable along a predetermined path for mixing a liquid-solids slurry formed by liquid and solid materials placed in the chamber, the improvement comprising:



a filter device disposed within the chamber in close proximity to the positive-action mixing element so as to filter a continous flow of liquid-solids slurry presented by the positive-action mixing element;

means for removing any cake buildup of aggregated slurry particles which form on the filter device, said removing means being operative to remove cake buildup while the slurry and the filter remain in the chamber, said filter device being positioned so that mechanical mixing action of the positive-action mixing element removes skin from any cake buildup of aggregated particles forming on the filter device; and

means for withdrawing liquid accumulating in the filter device while the filter is in the chamber to reduce the slurry to a batch of dry particulate while still in the chamber.

4,622,153

LIQUID POLYMER CONTAINING COMPOSITIONS FOR THICKENING AQUEOUS SYSTEMS

Kenneth E. Watson, and Keith W. Sharp, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Jan. 25, 1980, Ser. No. 115,405

Int. Cl.[4] C09K 7/02; E21B 43/00

U.S. Cl. 252—8.514 **2 Claims**

1. A liquid, pourable, water dispersible polymer containing composition for thickening aqueous mediums comprising from about 25 to about 55% by weight, based on the total weight of said composition, of hydroxyethyl cellulose, from about 35 to 70% by weight, based on the total weight of said composition, of a liquid hydrocarbon selected from the class consisting of liquid aliphatic hydrocarbons, liquid aromatic hydrocarbons and mixtures thereof, a methyl benzyl dialkyl ammonium bentonite gelling agent wherein the alkyl group contains from 14 to 22 carbon atoms and a dispersant selected from the group consisting of methanol and mixtures of methanol and water.

4,622,154

AQUEOUS FABRIC SOFTENING COMPOSITION

Robert M. Butterworth; John R. Martin, and Edwin Willis, all of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 4, 1985, Ser. No. 719,677

Claims priority, application United Kingdom, Apr. 19, 1984, 8410320

Int. Cl.[4] D06M 1/00

U.S. Cl. 252—8.8 **6 Claims**

1. An aqueous fabric softening composition comprising:

(i) an aqueous base;

(ii) at least 1% to less than 10% by weight of a water-insoluble cationic fabric softener; and

(iii) a nonionic material which comprises an alkylene oxide adduct of a fatty amine, the fatty amine containing at least 10 carbon atoms and the adduct containing an average of not more than 7 alkylene oxide groups per molecule, the total level of the cationic fabric softener and the nonionic material being at least 12% by weight.

4,622,155

METHOD FOR FRACTURING SUBTERRANEAN FORMATIONS

Lawrence E. Harris; Marlin D. Holtmyer, and Richard W. Pauls, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

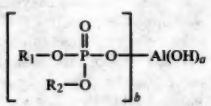
Continuation of Ser. No. 589,188, Mar. 13, 1984, abandoned. This application Aug. 12, 1985, Ser. No. 764,972

Int. Cl.[4] E21B 43/26

U.S. Cl. 252—8.551 **13 Claims**

1. A method for fracturing a subterranean formation having an elevated temperature comprising:

adding at a temperature of less than about 125° F. to a hydrocarbon liquid, a phosphoric acid ester in an amount sufficient to provide a concentration of from about 25 to about 200 pounds of ester per 1000 gallons of hydrocarbon liquid and a basic aluminum compound in an amount sufficient to provide a concentration of from about 1 to about 15 pounds of said compound per 1000 gallons of hydrocarbon liquid to form, in situ, at least one aluminum salt selected from the group having the structural formulae:



(I)

where

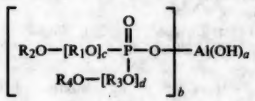
a=0 to 2,

b=1 to 3,

and the sum of a+b=3;

R_1=a phenyl or aliphatic hydrocarbon substituted-phenyl group containing from 6 to 24 carbon atoms, and

R_2=a phenyl, aliphatic hydrocarbon substituted-phenyl or aliphatic hydrocarbon group containing from 1 to 24 carbon atoms, or H; provided, however, that where R_1 is an phenyl group, then R_2 must be either an aliphatic hydrocarbon group containing at least six carbon atoms, or an aliphatic hydrocarbon substituted-phenyl group containing at least twelve carbon atoms; and provided that if R_2 is a phenyl group, then R_1 is an aliphatic hydrocarbon substituted-phenyl group containing at least 12 carbon atoms; and provided that if both R_1 and R_2 are aliphatic hydrocarbon substituted-phenyl groups; one of R_1 and R_2 contains at least 12 carbon atoms; and provided that where R_1 is an aliphatic hydrocarbon substituted-phenyl containing less than 12 carbon atoms and R_2 is aliphatic hydrocarbon, R_2 must contain at least six carbon atoms; and



(2)

where

a=0 to 2,

b=1 to 3,

c=1 to 5,

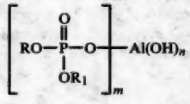
d=1 to 5,

and the sum of a+b=3;

R_1O and R_3O=an alkyloxy, alkenyloxy or alkynyloxy group containing from 1 to 18 carbon atoms, or $CH_2CH(CH_3)O$, or CH_2CH_2O, and

R_2O and R_4O=an alkyloxy, alkenyloxy or alkynyloxy group containing from 1 to 18 carbon atoms, and wherein

R_1O and R_2O may differ from each other but shall together contain from 1 to 24 carbon atoms, and R_3O and R_4O may differ from each other but shall together contain from 1 to 20 carbon atoms, provided that at least one of R_1O and R_3O shall be either $CH_2CH(CH_3)O$ or CH_2CH_2O and provided further that where either R_1O or R_3O is neither $CH_2CH(CH_3)O$ nor CH_2CH_2O, then the respective R_2O or R_4O group otherwise bonded thereto shall be deleted; and



(3)

where

m=1 to 3,

n=0 to 2,

and the sum of n+m=3; and

R and R_1 are independently C_1 to C_{20} alkyls, or C_2 to C_{20} alkenyls, or C_2 to C_{20} alkynyls, or R or R_1, but not both, may be H; provided, however, that where either R or R_1 contains fewer than six carbon atoms, then the other of R or R_1 contains at least seven carbon atoms whereby the liquid hydrocarbon is caused to form a pumpable initial gel;

aging said initial gel for a period of at least about twelve hours whereby said gel is caused to develop an initial apparent viscosity in the range of from about 100 to about 500 centipoise at a shear rate of 40 sec^{-1};

adding to said aged initial gel, at a temperature below about 125° F., as an aqueous solution containing an additional quantity of a basic aluminum compound in an amount in the range of from about 0.5 to about 15 pounds per 1000 gallons of hydrocarbon liquid to react with said ester to effect additional gelling of said pumpable initial gel;

introducing said aged initial gel containing said additional basic aluminum compound into a well bore communicating with a subterranean formation having a temperature in excess of about 125° F. substantially simultaneously with said addition of said additional basic aluminum compound whereby said fluid is heated during said additional gelling to form a gelled fluid having a viscosity in the formation sufficient to transport a propping agent into a created fracture in said subterranean formation; and

fracturing said formation with said introduced gel.

4,622,156

TANNING OF LEATHER

David J. Randall, Slough, England, assignor to Alcan International Limited, Montreal, Canada

Filed Apr. 4, 1985, Ser. No. 719,732

Claims priority, application United Kingdom, Apr. 10, 1984, 8409266

Int. Cl.⁴ C14C *9/00*

U.S. Cl. 252—8.57 **20 Claims**

1. In a method of tanning skins and hides which comprises treating the skin or hide with an aqueous solution containing a chromium compound to tan the skin or hide, the improvement which comprises adding to the solution a material consisting of reactive alumina hydrate to increase the pH of the solution to a value not exceeding about 4.5.

4,622,157

HYDRAULIC FLUID SYSTEM WITH PISTON AND VANE PUMPS

Robert L. Peeler, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 646,398, Aug. 31, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 782,667

Int. Cl.⁴ C10M *137/10, 141/12*

U.S. Cl. 252—32.7 E **7 Claims**

1. In a hydraulic system containing a piston-type and vane-type pump and wherein said piston-type pump contains wear surfaces containing copper or a copper alloy and the vane-type pump contains wear surfaces containing steel, the improvement comprising utilizing a common sump for the hydraulic fluid used in said piston and vane pumps, said hydraulic fluid composition comprising a major amount of an oil of lubricating viscosity and 0.1 to 2.5 weight percent of a zinc dithiophosphate and 0.01 to 5.0 weight percent of a sulfurized ester-olefin containing at least 13 weight percent sulfur and wherein the phosphorus to ester-sulfur atom ratio in said fluid is in the range 1:1 to 5:1 and the total sulfur in said fluid resulting from the sulfurized ester-olefin is in the range of 25–500 parts per million.

4,622,158

AQUEOUS SYSTEMS CONTAINING ORGANO-BORATE COMPOUNDS

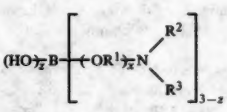
Reed H. Walsh, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Nov. 9, 1983, Ser. No. 550,325

Int. Cl.⁴ C10M *133/46, 139/00*

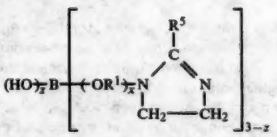
U.S. Cl. 252—49.3 **30 Claims**

1. A composition comprising an aqueous phase and dispersed or dissolved in said aqueous phase an organo-borate compound having the formula



(I)

or



(II)

wherein

R^1 is a divalent hydrocarbon-based group,

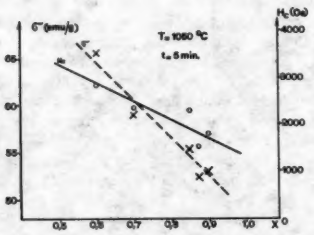
R^2 is a hydrocarbon-based group or a group of the formula $-R^4O)_zH$,
R^3 and R^5 are hydrocarbon-based groups,
R^4 is a divalent hydrocarbon-based group,
x is a integer of at least 1,
y is an integer of at least 1,
the sum of x and y has an average in the range of about 2 to about 75, and
z is 0, 1 or 2,
said composition containing a sufficient amount of water to disperse or dissolve the organo-borate compound.

4,622,159

METHOD FOR THE PREPARATION OF FINE HEXAGONAL FERRITE POWDERS, IN PARTICULAR, FOR MAGNETIC RECORDING

Francesca Licci; Stefano Rinaldi, both of Parma, and Tullo Besagni, Trecasali-Parma, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Italy

Filed Oct. 4, 1985, Ser. No. 784,245
Claims priority, application Italy, Oct. 12, 1984, 40095 A/84
Int. Cl.⁴ C04B *35/26*
U.S. Cl. 252—62.63 **11 Claims**



1. A method for the preparation of fine hexagonal ferrite powders, in particular for magnetic recording, characterised in that it comprises the following steps:
preparation of a solution of ferric citrate in water having an excess of citric acid over iron;
addition of a soluble compound of an alkaline earth metal (Re) in stoichiometric proportion determined by the stoichiometry of the end-product;
addition of a soluble compound of cobalt in stoichiometric proportion determined by the stoichiometry of the end-product;
addition of a soluble compound of titanium in stoichiometric proportion determined by the stoichiometry of the end-product;
first application of heat at below 100° C. by means of which to eliminate unwanted by-products;
addition of ethylene glycol in a proportion of 10% by volume (approx) of the solution with the resultant formation of organic macromolecules having chemically bonded inorganic ions;
a second application of heat to bring about total dehydration and resultant formation of a solidified mass possessing the same cationic composition and the same chemical uniformity as the original solution;
a third application of heat at between 400° . . . 450° C., bringing about total elimination of the organic part of the solidified mass; and
a final application of heat by means of which to induce crystallization of the hexaferrite.

4,622,160

HEAT-TRANSFER FLUID

Gary R. Buske; Terry L. Wenger, and John A. Beyrau, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 23, 1985, Ser. No. 790,549
Int. Cl.⁴ C09K *5/00*
U.S. Cl. 252—73 **16 Claims**

1. A heat-transfer fluid comprising a mixture of (a) a lower alkyl biphenyl wherein the lower alkyl group(s) contain fewer than about 6 carbon atoms and (b) a diethylbenzene in such proportions that the heat-transfer fluid both is pumpable at a temperature of −20° F. (−29° C.) and has a normal boiling point above about 360° F. (182° C.).

4,622,161

DOSING UNIT COMPRISING A DETERGENT AND/OR A BLEACHING AGENT

Emery G. P. Cornelissens, Nootdorp; Jurjen P. Hofland, Zevenaar, and Lambertus C. Mets, Arnhem, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 656,889, Oct. 2, 1984, abandoned. This application Dec. 12, 1985, Ser. No. 807,214
Claims priority, application Netherlands, Oct. 3, 1983, 8303380
Int. Cl.⁴ C11D *17/04*
U.S. Cl. 252—90 **13 Claims**

1. A dosing unit comprising at least one compound selected from the group consisting of detergents and bleaching agents, a satchet comprising a sealable substrate provided with one or more seams sealed with a water sensitive coating composition, wherein the coating composition comprises 60 to 95 percent by weight polyvinyl pyrrolidone and 5 to 40 percent by weight polyethylene imine respectively and wherein said one or more seams will open upon contact with an aqueous solution for between 2 and 20 minutes.

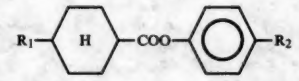
4,622,162

LIQUID CRYSTAL COMPOSITION

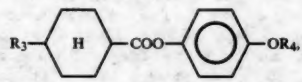
Naofumi Kimura; Kenichi Makagawa, both of Tenri; Yutaka Ishii, Nara, and Fumiaki Funada, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 30, 1984, Ser. No. 615,475
Claims priority, application Japan, May 31, 1983, 58-98590
Int. Cl.⁴ C09K *3/34*; G02F *1/13*
U.S. Cl. 252—299.5 **4 Claims**

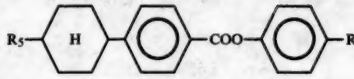
1. A liquid crystal composition which comprises of at least one compound selected from each of the following groups of compound:
the first group which consists of compounds expressed as the structural formulas,



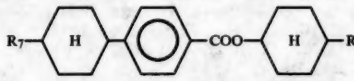
and



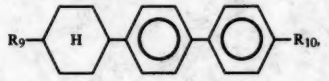
the second group which consists of compounds expressed as the structural formulas,

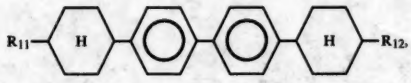


and



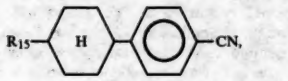
the third group which consists of compounds expressed as the structural formulas,

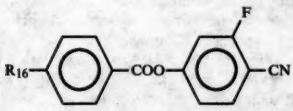




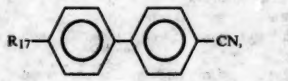
and

the fourth group which consists of compounds expressed as the structural formulas,

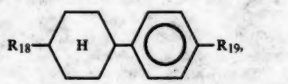




and



and the fifth group which consists of compounds expressed as the structural formula,



wherein groups R_1 to R_{19} are all straight-chain, alkyl groups expressed as C_nH_{2n+1} (n=1~7) and wherein the compounds from the first and second groups are present in an amount of from 10 to 30% by weight, the compound from the third group is present in an amount of from 20 to 35% by weight, the compound from the fourth group is present in an amount of from 15 to 30% by weight, and the compound from the fifth group is present in an amount of more than 10% by weight.

165-330 O.G.-86-10

4,622,163

ANISOTROPIC COMPOUNDS AND LIQUID CRYSTAL MIXTURES

Tuong Huynh-Ba, Pully, and Maged A. Osman, Zürich, both of Switzerland, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

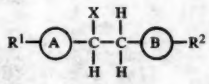
Filed Sep. 10, 1984, Ser. No. 648,439

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332691

Int. Cl.[4] **C07D** *403/12;* **C09K** *3/34;* **G02F** *1/13;* **C07C** *121/46, 19/00, 21/66, 69/76, 43/225*

U.S. Cl. 252—299.61 **20 Claims**

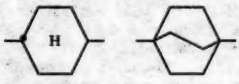
1. In a liquid crystalline mixture comprising at least two liquid crystalline components, the improvement wherein at least one of said components is an anisotropic compound carrying at least one cross-polarizing substituent and of the formula (1)



(1)

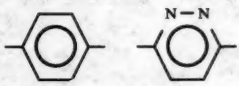
wherein X is cyano or halo,

A is a cycloaliphatic radical of the formula (1a) or (1b)



(1a) (1b)

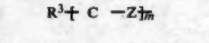
B is a cycloaliphatic radical of the formula (1a) or (1b) or an aromatic radical of the formula (1c) or (1d)



(1c) (1d)

X can be attached to the C-atom adjacent to B when B is cycloaliphatic

R^1 and R^2 are identical or different and each is a radical of the formula (1e)



(1e)

C has one of the meanings given for ring B,

R^3 is hydrogen, alkyl, alkoxy, alkoxy-carbonyl or alkylcarbonyloxy wherein the alkyl portion of each contains 1–12 C atoms, or such a C_{1-12}-group which carries one or more substituents which are halo or cyano, at most one of these substituents being attached to each atom of the carbon chain,

Z is a covalent bond or a bridge group of the formula —CH_2O—, —OCH_2—, —$C(X^1)(H)$—CH_2—, —CH_2—$C(X^1)(H)$—, —OOC— or —COO—,

X^1 is hydrogen or has one of the meanings given for X,

and m is 0 or 1,

with the provisos that

(a) groups of the formula —CH_2O— or —C(X)(H)— are not bonded directly via their C atoms to any aromatic radical of the formula (1c) or (1d) present in the molecule, except when X=F, and

(b) R^3 is not hydrogen if m is 0 or if C is cycloaliphatic.

4,622,164
BICYCLOHEXYLS

Rudolf Eidenschink, Münster; Michael Römer, Rodgau; Georg Weber, Erzhausen, all of Fed. Rep. of Germany; George W. Gray, Cottingham, and Kenneth J. Toyne, Hull, both of Great Britain, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany and The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jun. 14, 1984, Ser. No. 620,775

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321373

Int. Cl.[4] C09K *3/34*; G02F *1/13*; C07C *43/184, 43/115, 13/28*

U.S. Cl. 252—299.63 **7 Claims**

1. In a liquid-crystal dielectric useful for electrooptical display elements and comprising at least two liquid-crystal components, the improvement wherein at least one component is a bicyclohexyl of the formula

$$R^1—Cy—Cy—R^2$$

wherein R^1 and R^2 are each alkyl of 1–10 C atoms or R^2 may also be alkoxy of 1–10 C atoms, and Cy is 1,4-cyclohexylene.

4,622,165
LIQUID CRYSTAL MIXTURE OF A LIQUID CRYSTAL COMPOUND HAVING A SMECTIC C PHASE AND AN OPTICALLY ACTIVE COMPOUND

Mitsuru Kano; Yoshinori Kato; Yoshimi Kamijo, all of Furukawa, and Masahiro Hatano, 2-21-1 Nakayama, Sendai-shi, Miyagi-ken, all of Japan, assignors to Alps Electric Co., Ltd and Masahiro Hatano, both of, Japan

Filed Jul. 27, 1984, Ser. No. 635,263

Claims priority, application Japan, Jul. 27, 1983, 58-135743

Int. Cl.[4] C09K *3/34*; G02F *1/13*

U.S. Cl. 252—299.65 **13 Claims**

1. A liquid crystal composition exhibiting a chiral smectic C phase which comprises a mixture of a liquid crystal compound having a non-chiral smectic C phase and an optically active compound, both of said liquid crystal compound and optically active compound having an ester linkage in the central core of its molecular structure.

4,622,166
PROCESS FOR PREPARATION OF ZEOLITE SLURRY EXCELLENT IN STATIC STABILITY AND DYNAMIC STABILITY

Tadahisa Nakazawa, Tokyo; Koichi Usui; Masahide Ogawa, both of Shibata; Kiyoshi Abe, and Takashi Tokita, both of Nakajo, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 359,125, Mar. 17, 1982. This application Jul. 5, 1984, Ser. No. 626,490

Int. Cl.[4] B01J *13/00*; C01D *7/16*

U.S. Cl. 252—313.1 **14 Claims**

1. A process for the preparation of a zeolite slurry being excellent in both its staic stability and its dynamic stability and having a good flowability, which comprises stirring a wet cake containing water and zeolite in such a state that both are substantially inseparable from each other by filtration and further containing 0.1 to 1.0% by weight of free alkali to form a slurry of zeolite, blowing carbon dioxide gas into the zeolite slurry to neutralize the slurry so that the pH value (P_1) of the zeolite slurry at the time of completion of addition of said gas is in the range of from 10 to 11.5 and the pH value (P_2) of the zeolite slurry in the stationary state when 4 hours have passed from at time of completion of addition of said gas is in the range of from 11.5 to 12.5 and that the value of (P_2-P_1) is in the range of from 0.7 to 1.3, adding a water-soluble or water-dispersible organic polymeric dispersant in an amount of at least 0.1% by weight based on the anhydrous zeolite to the neutralized zeolite slurry, and subjecting the resulting slurry to highly shearing stirring.

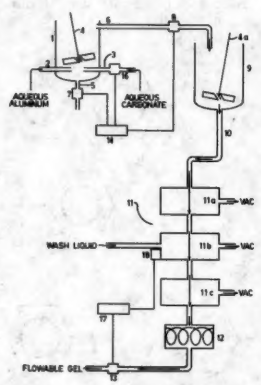
4,622,167
LOW VISCOSITY ALUMINUM HYDROXY CARBONATE GEL PROCESS

Wilbur G. Heath, Rehoboth Beach, and Robert B. Casey, Milford, both of Del., assignors to Barcroft Company, Lewes, Del.

Filed Dec. 27, 1984, Ser. No. 686,744

Int. Cl.[4] B01J *13/00*; A61K *33/10*

U.S. Cl. 252—315.7 **21 Claims**



1. A continuous process for the production of aluminum hydroxide carbonate gel having predetermined values of viscosity and alkali ion content and including particles having a predetermined net surface charge comprising:

(A) forming an acidic aqueous reaction mixture by combining continuously fed charges of an aqueous solution of alkali carbonate and an aqueous solution of aluminum salt;

(B) forming in said mixture a reaction product which includes aluminum hydroxide wherein the pH of said mixture containing said aluminum hydroxide tends to vary;

(C) maintaining the pH of said reaction mixture at a predetermined value (±0.1) thereby producing a gel wherein said alkali ion content is correlated to said net surface charge;

(D) continuously withdrawing from said mixture said product in an unequilibrated form;

(E) forming an equilibrated product by equilibrating said withdrawn product under naturally occurring pH conditions; and

(F) recovering from said equilibrated product said aluminum hydroxide gel.

4,622,168
STABILIZER FOR AMINE/QUATERNARY AMMONIUM BLENDS

David E. Whittlinger, Janesville, Wis., assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Filed Apr. 19, 1985, Ser. No. 725,253

Int. Cl.[4] B01F *17/16, 17/18, 17/32*

U.S. Cl. 252—352 **15 Claims**

1. A method for improving the storage stability at elevated storage temperatures of a blend of an amine and an imidazolinium compound which comprises adding an effective amount of an alkali metal or alkaline earth metal bisulfite agent to said blend.

11. A storage stable blend of an amine and an imidazolinium

compound which blend is stable at elevated temperatures of storage, which comprises:

(a) between about 5 and 50 percent amine;

(b) between about 95 and 50 percent imidazolinium compound; and

(c) an effective amount of an alkali metal or alkaline earth metal bisulfite agent.

4,622,169

ELECTRICALLY CONDUCTING COMPLEXES

Gregory K. Rickle, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 1, 1984, Ser. No. 667,301
Int. Cl.[4] H01B *1/00, 1/06*
U.S. Cl. 252—500 **48 Claims**

1. A complex comprising the reaction product of

(a) an anthraquinone, naphthaquinone, or both; and

(b) a metal ion;

wherein the complex has a conductivity of between about 0.0001 and 30 S/cm.

30. An electrically conducting complex prepared by the process which comprises contacting

(a) an anthraquinone or naphthaquinone substituted with at least one amino group and further substituted with at least one amino, hydroxy or mercapto group, wherein one amino group and one amino, hydroxy or mercapto group are on nonadjacent carbon atoms; with

(b) a Group VIII, Group IB or Group IIB salt;

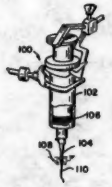
in a polar aprotic reaction medium, in the presence of an oxygen-containing gas under conditions such that an electric conducting complex is prepared.

4,622,170

ELECTRICALLY CONDUCTIVE COFACIALLY CRYSTALLIZING ORGANOMACROCYCLE FORMING COMPOSITIONS

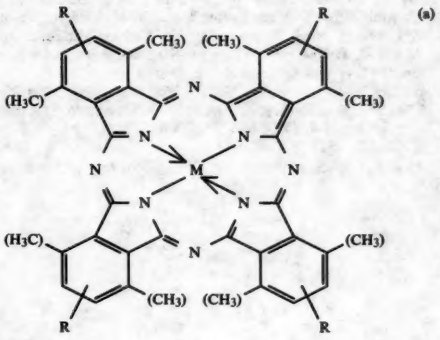
Kenneth J. Wynne, Falls Church, Va.; Tobin J. Marks, and Tamotsu Inabe, both of Evanston, Ill., assignors to Northwestern University, Evanston, Ill.

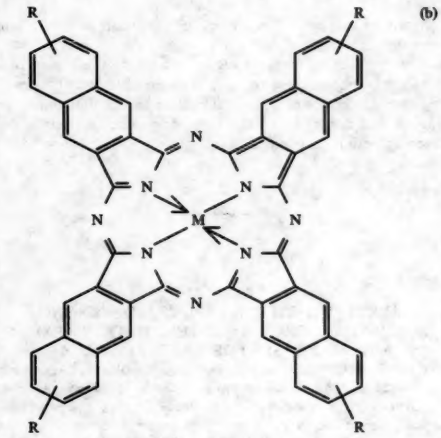
Division of Ser. No. 451,408, Dec. 20, 1982, Pat. No. 4,563,300.
This application Oct. 15, 1985, Ser. No. 787,514
Int. Cl.[4] H01B *1/12, 1/20, 1/06*
U.S. Cl. 252—518 **9 Claims**



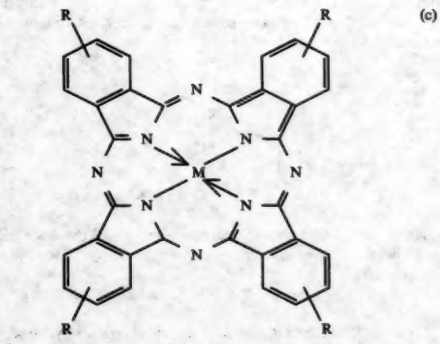
1. A forming composition for fabricating low dimensionally electroconductive articles comprising a viscous solution having at least about 3 percent by weight, based on the total weight of said solution, of a cofacially stacking ionically bonding porphyrazine, of the general formula $(Pc)M_n$ where Pc comprises pyrrole nuclei linked by nitrogen atoms to form a conjugated planar ligand having in a neutral state a 22 pi electron conjugation system, m comprises an ion selected from the group consisting of hydrogen ion and polyvalent transition metal ions and n is an integer, at least about three weight percent of a polyamide, and a strong Bronsted acid solvent, the weight ratio of said porphyrazine to said polyamide being at least about 1:3.

5. A forming composition for fabricating low dimensional electroconductive articles of predetermined form comprising a solution having an ionically bonding cofacially stacking fractional valence porphyrazine, said porphyrazine selected from the group of:





and,



where M=a divalent transition metal; R=H, CH_3, or an alkyl group; and an aromatic polyamide for providing structural integrity to said article, said polyamide having aromatic nuclei devoid of substituents capable of disrupting the cofacial stacking of said porphyrazine component.

4,622,171

POLYHYDROINDAN CARBOXALDEHYDES AND USES THEREOF IN AUGMENTING OR ENHANCING THE AROMAS OF PERFUME COMPOSITIONS, COLOGNES AND PERFUMED ARTICLES

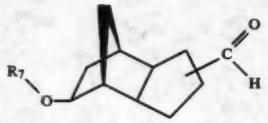
Mark A. Sprecker, Sea Bright; William L. Schreiber, Jackson; Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean; Manfred H. Vock, Locust; Patrick Whelan, Matawan, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 528,568, Sep. 1, 1983, Pat. No. 4,541,949. This application Mar. 15, 1985, Ser. No. 712,164

Int. Cl.[4] A61K 7/46; C07C 7/34

U.S. Cl. 252—522 R 6 Claims

1. A composition of matter defined according to the structure:



wherein R_7 is selected from the group consisting of methyl and isopropyl.

4. A process for augmenting or enhancing the aroma of a perfume composition comprising the step of intimately admixing with a perfume composition base an aroma augmenting or enhancing quantity of at least one composition of matter defined according to claim 1.

4,622,172

ALKYL-SUBSTITUTED SPIROUNDECENONE DERIVATIVES, ORGANOLEPTIC UTILITY THEREOF AND PROCESSES FOR PREPARING SAME

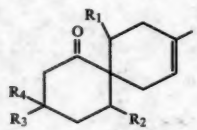
William L. Schreiber, Jackson; William D. Gillaspey, Aberdeen; Futoshi Fujioka, Wanamassa, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Dec. 6, 1985, Ser. No. 805,739

Int. Cl.[4] A61K 7/49; C07C 49/603

U.S. Cl. 252—522 R 9 Claims

1. An alkyl-substituted spiroundecenone derivative defined according to the structure:



wherein R_1 is isopropyl or hydrogen; and R_2, R_3 and R_4 are each the same and each represents methyl or hydrogen with the provisos:

(i) when R_1 is isopropyl then R_2, R_3 and R_4 are each hydrogen; and

(ii) when R_2, R_3 and R_4 are each methyl then R_1 is hydrogen.

2. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material, an aroma augmenting or enhancing quantity of the product of claim 1.

4,622,173

NON-AQUEOUS LIQUID LAUNDRY DETERGENTS CONTAINING THREE SURFACTANTS INCLUDING A POLYCARBOXYLIC ACID ESTER OF A NON-IONIC

Guy Broze, Grace-Hollogne, and Danielle Bastin, Soumagne, both of Belgium, assignors to Colgate-Palmolive Co., New York, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,816

Int. Cl.[4] C11D 1/06, 1/62, 1/72, 1/74

U.S. Cl. 252—528 12 Claims

1. A substantially non-aqueous liquid detergent composition comprising a surfactant mixture of

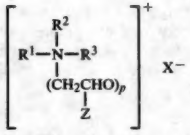
from about 40% to about 90% by weight of

(a) a liquid nonionic surfactant, and

from about 10% to about 60% by weight of a complex of

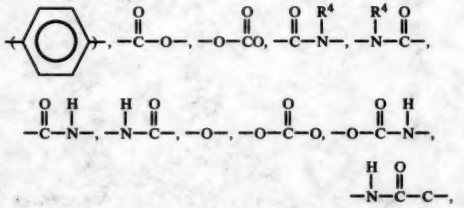
(B) an acid-modified nonionic surfactant which is an esterification reaction product between a nonionic surfactant which is a poly(C2 to C3 alkoxylated) fatty alcohol having a terminal hydroxyl group with a polycarboxylic acid or polycarboxylic acid anhydride, and

(C) an ethoxylated or propoxylated quaternary ammonium salt surfactant having the formula (I)



(I)

wherein R^1 is an organic group containing a straight or branched alkyl or alkenyl group optionally substituted with up to 3 phenyl or hydroxy groups, and optionally interrupted by up to 4 structures selected from the group consisting of



and mixtures thereof, where R^4 is an alkyl or hydroxyalkyl group containing 1 to 4 carbon atoms, or a benzyl group, and which contains from about 8 to 22 carbon atoms, and which may additionally contain up to 12 ethylene oxide groups, R^2 is the group R^1 or an alkyl or hydroxyalkyl group containing 1 to 6 carbon atoms, or a benzyl group; R^3 is the group R^2 or $(CH_2CHZO)_qH$; Z is hydrogen or methyl, and q and p are, independently, numbers from 1 to 12; and X is a water-soluble anion,

said complex comprising a molar ratio of (B)/(C) in the range of from about 3:1 to 1:3.

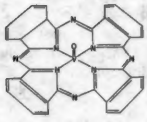
2. The composition of claim 1 which further comprises at least one detergent builder salt suspended throughout said liquid non-ionic surfactant (A).

4,622,174

TRANSPARENT PROTECTIVE LASER SHIELD

Vincent McKoy, Flintridge, and Amitave Gupta, Pasadena, both of Calif., assignors to Barnes Engineering Company, Stamford, Conn.

Filed Jun. 5, 1984, Ser. No. 617,320
Int. Cl.[4] G02B 5/28; G02F 1/01; H01S 3/10; H03F 7/00
U.S. Cl. 252—582 2 Claims



1. A transparent protective laser shield which is interposed between a laser beam and a viewer for absorbing the narrow band laser beam radiation while transmitting optical radiation within a broader wave length band which includes the narrow band laser beam radiation comprising:

a transparent material having substantial transmission of optical radiation over a selected broad wave length band,

said transparent material containing a chromophore of a porphyrin complex combined with platinum further modified by the addition of eight ethyl groups to said porphyrin complex thereby providing a chromophore of platinum octaethylporphyrin for establishing a strong absorption narrow wave length band for absorbing a double YAG laser beam radiation at approximately 532 nanometers, and

said transparent material having said chromphore dispersed therein forming a laser shield having an optical density in the range of 3 to 12 which is interposed between the viewer and a laser beam for absorbing said double YAG laser beam while passing at least 50° of the optical radiation in said broad wave length band surrounding said narrow-band laser beam thereby protecting the viewer from said laser beam.

4,622,175

PROCESS FOR SOLIDIFYING RADIOACTIVE WASTE

Shin Tamata, and Susumu Horiuchi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,994
Claims priority, application Japan, Mar. 25, 1982, 57-48651; Mar. 25, 1982, 57-48652
Int. Cl.[4] G21F 9/16; C04B 12/04; C09D 1/02
U.S. Cl. 252—628 16 Claims

1. A process for solidifying radioactive waste which comprises:

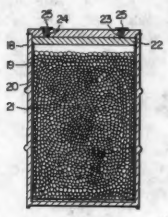
providing a container;

providing radioactive waste in said container;

adding an alkali silicate composition comprising amorphous reactive silica and a curing agent, wherein silica having a specific surface area of 50 to 500 m^2/g is used to make the alkali silicate and is obtained by the acid treatment of acid earth;

mixing the radioactive waste and the alkali silicate composition in the container; and

curing the resulting mixture; wherein the alkali silicate composition comprises 40 to 65 parts by weight of amorphous reactive silica, 25–35 parts by weight of sodium silicofluoride, 1–10 parts by weight of silicon phosphate, 10–20



parts by weight of barium silicate and 5–15 parts by weight of cement, the total being 100 parts by weight.

4,622,176

METHOD OF PROCESSING RADIOACTIVE LIQUID WASTES CONTAINING RADIOACTIVE RUTHENIUM

Ryozo Motoki; Shoji Motoishi; Mishiroku Izumo; Katsuyuki Onoma, all of Ibaraki, and Toshikazu Sato, Tokyo, all of Japan, assignors to Japan Atomic Energy Research Institute and Mitsui Mining & Smelting Co., both of Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 680,701
Claims priority, application Japan, Dec. 15, 1983, 58-237131
Int. Cl.[4] G21F 9/12, 9/04; C01G 55/00
U.S. Cl. 252—631 2 Claims

1. A method of processing radioactive liquid wastes containing radioactive ruthenium by passing said wastes having pH of about 2 to about 12 through a column packed with an adsorbent comprising a 1:1:0.01 mixture of activated carbon, zinc and palladium powders.

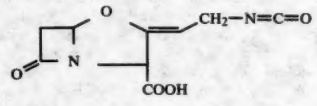
4,622,177

9-DEOXY-9-ISOCYANATO CLAVULANTE INTERMEDIATES

John B. Harbridge, Redhill, England, assignor to Beecham Group p.l.c., United Kingdom

Filed Sep. 9, 1983, Ser. No. 530,752
Claims priority, application United Kingdom, Sep. 11, 1982, 8225989
Int. Cl.[4] C07D 487/04
U.S. Cl. 540—348 4 Claims

1. A compound of formula I



(I)

or a salt of a carboxylic acid or ester thereof.

4,622,178
PROCESS FOR PREPARING AZETIDINONE DERIVATIVES

Shigeru Torii; Hideo Tanaka; Junzo Nogami, all of Okayama; Michio Sasaoka, Tokushima; Norio Saito, Tokushima, and Takashi Shiroi, Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP83/00298, § 371 Date May 1, 1984, § 102(e) Date May 1, 1984, PCT Pub. No. WO84/00960, PCT Pub. Date Mar. 15, 1984

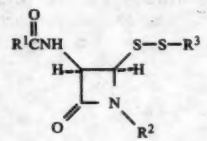
PCT Filed Sep. 6, 1983, Ser. No. 608,695

Claims priority, application Japan, Sep. 6, 1982, 57-155674

Int. Cl.[4] C07D *205/08, 403/12, 401/12, 401/14*

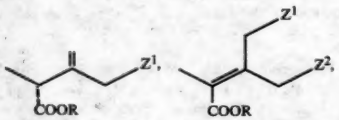
U.S. Cl. 540—358 **9 Claims**

1. A process for preparing an azetidinone compound represented by the formula

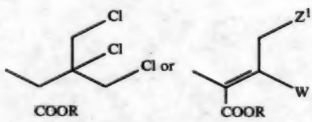


(I)

wherein R^1 represents a straight-chain or branched-chain lower alkyl group, phenyl, p-nitrophenyl, p-chlorophenyl, benzyl, p-nitrophenylmethyl, p-chlorophenylmethyl, p-methoxyphenylmethyl, diphenylmethyl, phenoxymethyl, p-nitrophenoxymethyl or p-chlorophenoxymethyl, R^2 represents hydrogen, acetyl, propionyl, butyryl, trimethylsilyl, dimethylbutylsilyl, methanesulfonyl, ethanesulfonyl, phenylsulfonyl, p-toluenesulfonyl, diphenylphosphonyl, dibenzylphosphonyl, diethylphosphonyl, or a group represented by the formula

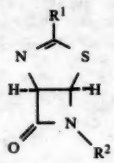


(IV) (V)



(VI) (VII)

wherein R is hydrogen or a carboxyl-protecting group, Z^1 and Z^2 are the same or different and are each hydrogen, a halogen, methylthio, ethylthio, phenylthio, p-nitrophenylthio, pentachlorophenylthio, 2-pyridylthio, 2-benzothiadiazolylthio, 1,3,4-thiadiazole-5-ylthio, 2-substituted-1,3,4-thiadiazole-5-ylthio, 1,2,3,4-tetrazole-5-ylthio, 1-substituted-1,2,3,4-tetrazole-5-ylthio, ethoxythiocarbonylthio, N,N-diethyldithiocarbamate, N,N-dimethyldithiocarbamate, phenylsulfonyl, p-methylphenylsulfonyl, hydroxy, methoxy, ethoxy, acetoxy, benzoyloxy, nitrosoxy, nitryloxy, dimethylamino or piperidine-1-yl, and W is a protected hydroxyl group, and R^3 represents phenyl, p-nitrophenyl, pentachlorophenyl or a group formed by eliminating one hydrogen atom from an aromatic heterocyclic compound containing a single heterocyclic ring (optionally fused to a benzene ring) of 5–6 members with no more than 4 heteroatoms selected from the group consisting of nitrogen and sulfur, said aromatic heterocyclic compound optionally having methyl, nitro, methoxy, $—CF_3$ or phenyl as a substituent, said process comprising reacting a thiazolinoazetidinone compound represented by the formula



(II)

wherein R^1 and R^2 are as defined above with a sulphur-containing compound represented by the formula

$$R^3—S—Y \qquad \text{(III)}$$

wherein R^3 is as defined above and Y represents $—SR^3$ (in which R^3 is as defined above), diethylamino, diisopropylamino, cyclohexylamino, morpholino, piperidino, pyrrolidino, phthalimido or succinimido in the presence of an acid in a hydrous organic solvent.

4,622,179
NAPHTHALOCYANINE COMPOUNDS

Tsunehito Eda, Kashihara, Japan, assignor to Yamamoto Kagaku Gosei Co., Ltd., Osaka, Japan

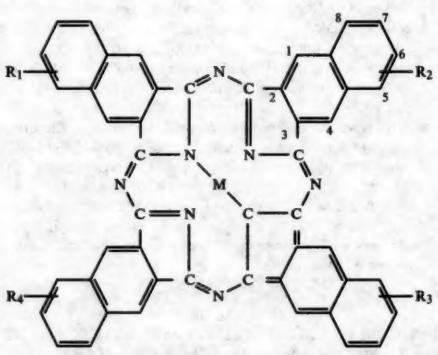
Filed Jul. 17, 1984, Ser. No. 631,700

Claims priority, application Japan, Jul. 19, 1983, 58-130272; Mar. 5, 1984, 59-41618

Int. Cl.[4] C09B *47/04*

U.S. Cl. 540—139 **18 Claims**

1. A naphthalocyanine compound represented by the general formula



characterized in that R_1, R_2, R_3 and R_4, which may be the same or different, are each a straight or branched alkyl group of 5 to 12 carbon atoms and M is a metal selected from the group consisting of Cu, Ni, Mg, Pb, Pd, V, Co, Nb, Al, Sn, In, Fe and Ge or its oxide, chloride or bromide.

4,622,180
DERIVATIVES OF GLYCEROPHOSPHOCHOLINE AND GLYCEROPHOSPHOETHANOLAMINE, THEIR PREPARATION AND THEIR USE

Friedrich Paltauf, and Albin Hermetter, both of Graz, Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

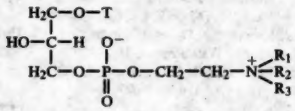
Filed May 13, 1985, Ser. No. 733,619

Claims priority, application Austria, May 15, 1984, 1590/84

Int. Cl.[4] C07C *15/16, 143/00;* **C07F** *9/08*

U.S. Cl. 260—389 **7 Claims**

1. Triphenylmethyl derivatives of sn-glycero-3-phosphocholine and sn-glycero-3-phosphoethanolamine of the formula



I

in which

T denotes an unsubstituted or substituted triphenylmethyl group wherein the substituent is C_{1-6} alkyl, C_{1-6} alkoxy or halogen and the radicals

R_1, R_2 and R_3 either are identical and each represent a methyl group or are different, in which case two of the radicals R_1, R_2 and R_3 always denote hydrogen and the third radical represents an unsubstituted or substituted triphenylmethyl group wherein the substituent is C_{1-6} alkyl, C_{1-6} alkoxy or halogen.

4,622,181

PROCESS FOR PRODUCING AN ESTRONE ACETAL

Kazumasa Kinugasa, Yokohama; Eiichiro Tanaka; Yoshihiro Tanaka, both of Kawasaki, and Yoshiharu Morita, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

PCT No. PCT/JP84/00030, § 371 Date Sep. 21, 1984, § 102(e) Date Sep. 21, 1984, PCT Pub. No. WO84/03094, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 1, 1984, Ser. No. 662,283

Claims priority, application Japan, Feb. 2, 1983, 58-15810

Int. Cl.⁴ C07J *1/00*

U.S. Cl. 260—397.4 **5 Claims**

1. A process for producing an estrone acetal which comprises reacting sodium and a polycyclic aromatic compound in a reaction solvent on an industrial scale of at least 25 liters to prepare radical anions and supplying a solution or slurry of androstane-1,4-diene-3,17-dione-17-acetal, hereinafter abbreviated as ADDK, prepared in a low boiling supplying solvent into the thus obtained reaction mixture to thereby reduce the same into an estrone acetal, wherein

(a) said reaction solvent satisfies the conditions that:

(i) said reaction solvent contains a polyether or mixture of polyethers having three or more ether bonds and said polyethers are present at 1.5–5 (v/w) times the total ADDK to be supplied,

(ii) the concentration of said polyethers is not less than 35 (v/v) %,

(iii) said reaction solvent optionally contains a solvent other than said polyethers which is present at not more than 5 (v/w) times the total ADDK to be supplied, and

(iv) the total amount of the reaction solvent is not less than 3 (v/w) times the total ADDK to be supplied;

(b) the temperatures for the preparing reaction of radical anions and the reducing reaction of ADDK are maintained in the range from the melting point of sodium to 105° C.; and

(c) the supplying solvent of ADDK is distilled out of the reaction system as required so that the reaction solvent can always maintain the foregoing conditions (ii)–(iv).

4,622,182

5-(4-ETHYNYLOPHENOXY)ISOPHTHALIC CHLORIDE

Paul M. Hergenrother, Yorktown, and Brian J. Jensen, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 613,139, May 23, 1984, Pat. No. 4,587,312. This application Jul. 31, 1985, Ser. No. 760,791

Int. Cl.⁴ C07C *63/72*

U.S. Cl. 260—544 P **1 Claim**

1. The compound 5-(4-ethynylphenoxy)isophthaloyl chloride.

4,622,183

DEVICE FOR TRANSFERRING COOLING WATER OF A WET OR WET/DRY COOLING TOWER TO RECIRCULATION MEANS

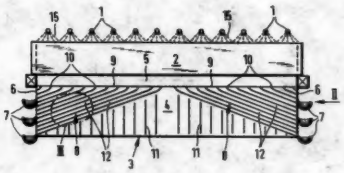
Hans Sonnenschein, Essen, and Paul Paikert, Witten, both of Fed. Rep. of Germany, assignors to Gea Luftkühlergesellschaft Happel GmbH & Co., Bochum, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 738,731

Claims priority, application European Pat. Off., May 29, 1984, 84710018.7

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—110 **19 Claims**



1. A device for transferring cooling water in a wet type or wet/dry type cooling tower, comprising water distributing means, a cooling air heat exchanger arranged below said water distributing means, an array of guiding plates arranged side by side below said cooling air heat exchanger to guide water discharged from the latter, said guiding plates having respectively a sloping upper part and an upright lower part, said lower part joining the upper part at a substantially horizontally directed transition line, at least one set of parallel channel-like embossments formed one above the other in each of said upright lower parts and extending between said transition line and a lateral edge of said lower part, said sloping upper part covering the gap between neighboring guiding plates; and at least one water collecting channel extending transversely relative to said guiding plates at lateral edges of the latter to collect water discharged from said embossments and to transfer the collected water to recirculating means.

4,622,184

METHOD OF MAKING PHOTOCHROMIC LENSES

Kenneth T. Barnhart, Corning; Carlo M. Golino, Caton, and Candace J. Quinn, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 694,081, Jan. 23, 1985, Pat. No. 4,581,288, which is a continuation-in-part of Ser. No. 543,970, Oct. 20, 1983, abandoned. This application Dec. 27, 1985, Ser. No. 814,041

Int. Cl.⁴ B29D *11/00*

U.S. Cl. 264—1.1 **5 Claims**

1. A method for preparing an essentially transparent, glass/-plastic composite body comprising the steps of:

(a) preparing a body of glass having a refractive index closely matching the plastic;

(b) comminuting said glass body to a powder;

(c) separating a fraction of glass powder, said fraction consisting of glass particles having dimensions between about 0.5–100 microns from said powder;

(d) removing adsorbed water from the surfaces of said glass particles;

(e) mixing said glass particles with said plastic in the liquid or particulate form, said glass particles comprising up to 50% by weight of the total mixture;

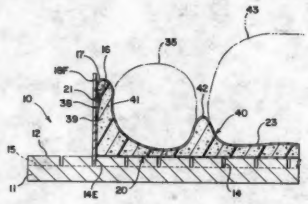
(f) subjecting said mixture to a vacuum to remove entrapped air; and

(g) forming said mixture into a shape of a desired geometry and either simultaneously with said forming or thereafter curing said plastic.

4,622,185
METHOD AND APPARATUS FOR MOLDING AND ACCURATELY REPOSITIONING SELECTED PORTIONS OF THE HUMAN ANATOMY

Jeffrey V. Kostich, Akron, Ohio, assignor to Smithers Medical Products, Inc., Hudson, Ohio

Filed Apr. 15, 1985, Ser. No. 723,146
Int. Cl.[4] B28B *7/34;* B29C *67/22, 33/40*
U.S. Cl. 264—45.2 12 Claims



1. A method of molding a template for repositioning a portion of human anatomy comprising the steps of:

providing a base means to which a plurality of slat means can be secured in selected positions;

positioning a flexible container means upon said base means;

introducing a homogeneous foam mixture into said flexible container means;

positioning a selected portion of human anatomy on said flexible container means and allowing said homogeneous foam mixture to rise around said portion of the human anatomy;

placing, simultaneously with further rising of said foaming mixture, a plurality of slat means against said flexible container means containing said foam mixture to direct said foam mixture around said portion of the human anatomy; and

waiting a sufficient length of time for said homogeneous foam mixture to set and form a template for said portion of the human anatomy.

4,622,186
PROCESS FOR PREPARATION SINTERED SILICON NITRIDE BODY HAVING SURFACE COMPRESSION STRESS

Michitaka Mizutani, Tsu, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Mar. 5, 1985, Ser. No. 708,090
Claims priority, application Japan, Mar. 6, 1984, 59-43576
Int. Cl.[4] C04B *35/58*
U.S. Cl. 264—62 8 Claims

1. A process for making a sintered silicon nitride body, comprising the steps of:

i. molding a first composition comprising silicon nitride and a sintering aid into a predetermined shape to form a green molded body;

ii. coating the green molded body obtained in step (i) with a slurry of a second composition comprising silicon nitride and a sintering aid, the sintering temperature of said second composition being 40° C. to 200° C. lower than that of the first composition;

iii. after step (ii), preliminarily sintering the coated molded body in an inert atmosphere at a temperature such that only the coating of the second composition is densified but the molded green body composed of the first composition is not densified; and

iv. after step (iii), subjecting the preliminarily sintered body to hot isostatic pressing in an inert atmosphere under temperature and pressure conditions which densify the molded body composed of the first composition.

4,622,187
CONTINUOUS PROCESS FOR MAKING INTERLACED POLYESTER YARNS

Russell N. Palmer, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

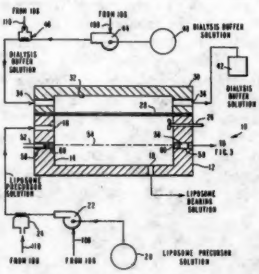
Filed May 23, 1984, Ser. No. 611,983
Int. Cl.[4] D02G *3/00*
U.S. Cl. 264—103 10 Claims

1. An improved continuous process for preparing high strength polyester yarn having a low shrinkage involving the steps of spinning molten poly(ethylene terephthalate) of high relative viscosity to form a multifilament yarn, then advancing the yarn while drawing at an elevated temperature to increase its strength, followed by a step of heating the yarn and overfeeding it to reduce its shrinkage, including a step of interlacing the yarn to provide coherency, and winding the interlaced yarn at a speed of at least 1800 ypm to form a package in a continuous process, the improvement characterized in that the temperature of the yarn is maintained above about 90° C. until completing winding the yarn package.

4,622,188
METHOD FOR MANUFACTURING LIPOSOMES

Marina Adamich, Boothwyn, Pa., and David T. Bach, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1984, Ser. No. 684,947
Int. Cl.[4] C12R *1/05;* B01J *13/02*
U.S. Cl. 264—4.6 4 Claims



1. A method for manufacturing liposomes comprising the steps of:

(a) relatively moving a dialysis buffer solution with respect to a liposome precursor solution to create a gradient across a permeable barrier therebetween and thereby cause the formation of liposomes within the precursor solution; and

(b) optically monitoring the light transmission of the precur-

sor solution to control the relative movement of the dialysis and precursor solutions in accordance therewith.

4,622,189

FLAT PRODUCTS COMPRISING AT LEAST TWO BONDED LAYERS

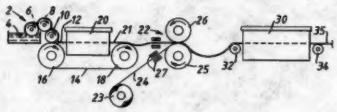
John Bellis, and Roy Mathers, both of Clywd, Wales, assignors to Mixalloy Limited, Clywd, Wales

Filed Aug. 7, 1985, Ser. No. 763,544

Claims priority, application United Kingdom, Aug. 10, 1984, 8420326

Int. Cl.[4] B22F *7/02*

U.S. Cl. 264—112 **10 Claims**



1. A method of producing strip comprising at least two material layers of different chemical composition bonded one to another, the method comprising forming separate slurries of inorganic powders of different chemical compositions in film-forming cellulose derivatives, producing from said slurries dried layers in strip form and feeding the dried strip layers while under tension in addition to that due to their own weight in interfacial contact into a nip of a pair of compaction rolls to effect a mechanical bond between the layers.

4,622,190

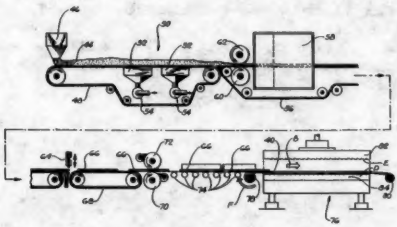
METHOD OF MAKING WET PROCESS PANELS OF COMPOSITE WOOD MATERIAL WITH SEMI-MATCHING CONTOURED PRESSURE PLATES

William J. Schultz, St. Charles, Ill., assignor to Masonite Corporation, Chicago, Ill.

Division of Ser. No. 470,608, Feb. 28, 1983, abandoned. This application Sep. 21, 1984, Ser. No. 653,056

Int. Cl.[4] B29C *43/02*

U.S. Cl. 264—119 **17 Claims**



1. A method of making a non-planar, contoured hardboard building panel of composite wood fibre material in a wet process, said panel having an outer contoured face and a generally matching contoured back face, said method comprising the steps of:

depositing a layer of wet, composite wood material in a relatively thick wet mat of wood fibres on a press wire screen mesh while said mesh is under tension for supporting said mat;

moving said tensioned screen mesh to carry said mat into a pressing position between a pair of spaced apart pressure plates having generally matched, contoured facing surfaces thereon for shaping said outer face and said back of face to generally match the contour of said outer face;

relaxing the tension on said screen mesh after said mesh and mat is between said pressure plates;

relatively moving said pressure plates toward one another to compress said thick mat of wet composite wood material to consolidate the fibres into a substantially thinner shell comprising a non-planar, contoured hardboard panel while forcing and deforming said screen mesh while tension thereof is relaxed against adjacent one of said pressure plates to generally conform to the contoured face thereof;

maintaining said pressure plates in a selected spaced apart relation for a time interval to permanently mold and shape said faces of said non-planar, contoured hardboard panel while permitting moisture from said wet composite wood material to escape around the edges of said compressed mat through voids provided between wires of said screen mesh while tension thereof is relaxed;

moving said pressure plates away from one another to release the pressure on said panel faces from said pressure plates;

retensioning said screen mesh to lift said non-planar, contoured hardboard panel away from said one pressure plate; and

moving said retensioned screen mesh to carry said non-planar, contoured hardboard panel away from said pressing position between said pressure plates to an unloading position wherein said panel is separated from said screen mesh.

4,622,191

METHOD FOR MANUFACTURING DECORATIVE MOLDING

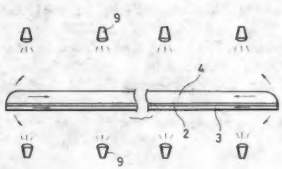
Shin Takeuchi, Aichi, Japan, assignor to Inoue Mtp Kabusiki Kaisha, Nagoya, Japan

Filed Aug. 23, 1984, Ser. No. 643,521

Claims priority, application Japan, Aug. 23, 1983, 58-153699

Int. Cl.[4] B29C *61/02*; B32B *31/26*

U.S. Cl. 264—134 **8 Claims**



1. A method for manufacturing a decorative molding having an outer surface with a round peripheral edge, comprising:

preparing an elongated shape of a decorative base plate which has an outer decorative layer and a mounting surface made of a plastic layer which shrinks when heated;

pouring thermo-setting liquid plastic onto the outer surface of the decorative layer of the base plate to coat the outer surface of the decorative layer with liquid plastic, and then;

heating the liquid plastic to cure the same, such curing resulting in shrinkage of the plastic coating in the longitudinal direction and a tendency to warp the base plate, and heating the plastic layer of the base plate so that a predetermined amount of shrinkage of the plastic layer in the longitudinal direction takes place to cancel the shrinkage of the coating and make the mounting surface of the base plate flat or slightly convex.

4,622,192

STAMPABLE SHEETS OF GLASS/CARBON FIBER MAT REINFORCED POLYMERS OF OLEFIN AND METHOD OF PREPARATION

Chen-Chi M. Ma, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 10, 1984, Ser. No. 569,624

Int. Cl.[4] B29C *24/00;* B32B *1/02, 17/04;* H05K *9/00*

U.S. Cl. 264—136 4 Claims

1. A method for preparing stampable composites of polymer of olefin and glass/carbon fiber mat comprising surrounding a fiber mat composite comprising mixtures of glass fiber and carbon fiber with a matrix of polymer of olefin having from 2–6 carbon atoms, said mixture of glass fiber and carbon fiber in a ratio of about 30 weight percent glass fibers to about 70 weight percent carbon fibers to about 70 weight percent fibers to about 30 weight percent carbon fibers wherein surrounding said fiber mat with polymer of olefin comprises:

(1) impregnating said mat with a slurry of polymer of olefin in a carrier liquid,

(2) drying said impregnated mat to remove carrier liquid thereby producing a dry, impregnated mat, and

(3) applying sufficient heat and pressure to said dried, impregnated mat to cause said polymer of olefin to flow around said fiber mat.

4. A method for preparing stamped composites of polymer of olefin and fiber mat composite comprising mixtures of glass fiber and carbon fiber, said method comprising subjecting at least one stampable composite of polymer of olefin and fiber mat composite comprising mixtures of glass fiber and carbon fiber prepared by the method of claim 1 to heating to a temperature range suitable for stamping and, subsequently, while the composite remains at said stamping temperature supplying sufficient pressure on the composite material within a stamping press to form an object from said composite.

4,622,193

METHOD FOR MAKING FREE FLOWING COATED RUBBER PELLETS

Edward N. Kresge, Watchung, and Donald R. Hazelton, Chatham Township, Morris County, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 621,179, Jun. 15, 1984, abandoned. This application Jan. 31, 1985, Ser. No. 696,726

Int. Cl.[4] B29B *9/06*

U.S. Cl. 264—141 9 Claims

1. A process for preparing a free flowing polymer pellet which comprises:

(a) intimately mixing an elastomeric polymer having a glass transition temperature (Tg) of less than 0° C. with a plastic polymer having a semicrystalline or crystalline melting point of at least 10° C. higher than the softening point of the elastomer; said plastic polymer and elastomeric polymer being insoluble in one another in the melt state;

(b) extruding the elastomer/plastic polymer mixture at an extrusion melt temperature above the melting point of the plastic, through a die having a die inlet and a die face said die face being the die outlet; maintaining a temperature gradient across the die from the die inlet to the die outlet, said temperature gradient being such that the polymer mixture has a melt temperature at the die outlet which is less than the extrusion melt temperature; and

(c) forming pellets of the extrudate;

thereby forming a pellet having a skin comprising the plastic polymer.

4,622,194

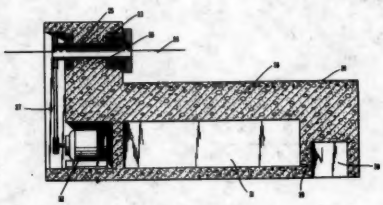
PROCESS FOR FORMING CONCRETE MACHINE TOOLS

Albert J. Rogers, Arlington; Michael E. Smith, Springfield, both of Va., and James E. Trounson, Washington, D.C., assignors to Cemtronics, Washington, D.C.

Continuation-in-part of Ser. No. 503,550, Jun. 13, 1983, abandoned. This application Nov. 16, 1984, Ser. No. 672,200

Int. Cl.[4] B28B *11/08;* B23Q *1/08, 1/26*

U.S. Cl. 264—162 9 Claims



1. A process for constructing a machine tool having means for holding a workpiece and means for holding a cutting tool comprising the steps of:

(a) constructing a form for at least one of said means for holding;

(b) pouring concrete into the form;

(c) allowing the concrete to set;

(d) grinding a surface of the set concrete to provide at least one ground concrete surface machine way for directly contacting a sliding surface of the other of said means for holding; and

(e) providing said other means for holding in direct contact with said ground concrete surface.

4,622,195

CONTINUOUS PROCESS FOR THE PRODUCTION OF POLYACRYLONITRILE FILAMENTS AND FIBERS

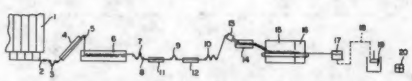
Michael Bueb; Dieter Paulini, both of Dormagen; Edgar Muschelknautz, Leverkusen; Wolfram Wagner, and Herbert Gröschel, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,578

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308657

Int. Cl.[4] D01S *5/22*

U.S. Cl. 264—168 13 Claims



1. A process for the production of polyacrylonitrile filaments and fibers comprising spinning a spinning solution in a hot-air spinning duct, taking off a dry spun tow at a speed of 150 to 400 m/minute and, without interruption, introducing the dry-spin tow having a tow weight of 10 to 100 g/m, to an after-treatment comprising:

(a) washing,

(b) drawing,

(c) crimping,

(d) preparating,

(e) steaming,

(f) drying and cooling,

said washing being carried out in several stages on the coun-

tercurrent principle and a vibrating duct being used to transport the tow through the washing process,

said drawing being carried out in a steam atmosphere at 100° to 130° C. before and/or after the washing process,

said crimping then being carried out in an aerodynamic crimping unit using a hot, gaseous medium under a pressure of from 5 to 16 bars and at a temperature of from 50° to 210° C.,

said preparating being continuously applied to the tow before, during or after crimping,

said steaming being carried out by transporting the tow in folded, tension-free form on a vibrating duct through a steaming apparatus and, at the same time, treating it with steam at 100° to 120° C., and

said drying conducted in folded form on a belt dryer using air heated to 60°–180° C., and said cooling conducted with cold air to temperatures below 50° C.

4,622,196

LINING OF PIPELINES AND PASSAGEWAYS

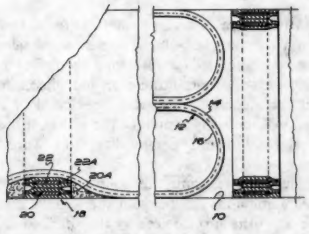
Eric Wood, Northants, England, assignor to Insituform Holdings Limited, St. Helier, Channel Islands

Filed Jan. 7, 1985, Ser. No. 689,193

Claims priority, application United Kingdom, Jan. 7, 1984, 8400365

Int. Cl.⁴ B29C *41/32*

U.S. Cl. 264—229 **16 Claims**



1. A method of lining a pipeline or passageway comprising the following steps:

A. inserting into the pipeline or passageway at spaced intervals one or more assemblies, each assembly comprising (i) a band of resin absorbent material impregnated with a curable synthetic resin and (ii) a ring of reinforcing material of narrower width than the band of absorbent material and located in relation thereto so that the absorbent material overlaps the edges of the band;

B. inserting into the pipeline or passageway before the resin impregnating said bands of material has cured, a resin impregnated tubular lining presenting a face of uncured resin to said assemblies so that the uncured resin face of the liner comes into resin contact with the overlapping portions of the bands of material; and

C. curing the resin of the bands of material and the liner whereby the reinforcing rings become embedded in cured resin and provide compressive hoop stress reinforcement for the liner.

4,622,197

APPLYING THERMOPLASTICS SLEEVE TO CRUSH RESISTANT TUBING

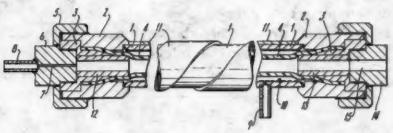
John C. Crownshaw, Sawbridgeworth, England, assignor to Standard Telephones and Cables Public Limited Company, London, England

Filed Sep. 28, 1984, Ser. No. 655,425

Claims priority, application United Kingdom, Oct. 1, 1983, 8326371

Int. Cl.⁴ B29C *63/20*

U.S. Cl. 264—230 **4 Claims**



1. A method of providing a polythene sheath fitting tightly around a crush resistant electrically conductive metal tail pipe of a regenerator of a submarine optical fibre cable, comprising placing a loose fit polythene sleeving preform around the tail pipe, placing the resulting assembly in a mould within the bore of a tubular elastomeric mould lining, applying heat to the preform to soften it and hydrostatic pressure to the outer surface of the lining to compress the preform radially and to collapse the preform tightly onto the tail pine while preventing extrusion of the preform in the axial direction by collars fitted around the tail pipe and secured in abutting relationship with the preform ends, and subsequent to the heating of the preform, directing a forced draft through the tail pipe bore to cool preferrentially the surface of the preform in contact with the tail pipe.

4,622,198

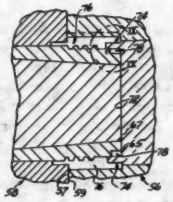
METHOD OF MAKING A COUPLING NUT FOR AN ELECTRICAL CONNECTOR HAVING A MOLDED ANTI-DECOUPLING MECHANISM

David O. Gallusser, Oneonta, and David L. Frear, Bainbridge, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Division of Ser. No. 637,184, Aug. 2, 1984, Pat. No. 4,548,458. This application Jul. 18, 1985, Ser. No. 756,415

Int. Cl.⁴ B28B *3/10*

U.S. Cl. 264—318 **2 Claims**



1. A method of making a coupling nut for an electrical connector of the type including a plurality of ratchet teeth around its outer periphery, said coupling nut being of the type having an integral spring finger extending therefrom for engaging the ratchet teeth whereby to resist rotation, the steps of the method being characterized by

providing a pair of mold cores and a pair of mold plates with said mold cores and mold plates having, respectively, an axial front face thereof positionable into abutting relation, said pair of mold plates when positioned defining a common passage therethrough for receiving the mold cores in

a clearance fit therewithin whereby to define a pair of annular cavities which represent the coupling nut and the spring finger, one and the other said mold core having, respectively, an arcuate relief portion extending longitudinally inward from its front face and a blade extending perpendicularly from its front face,

abutting the front faces of the mold cores so that the blade is confronting the relief portion to form one said annular cavity for forming the spring finger,

abutting the front faces of said mold plates,

mounting said mold core into the common passage of the mold plates to form the other annular cavity for forming the coupling nut, and

injecting plastic into the annular cavities whereby to form the coupling nut having an integral spring finger.

4,622,199

PROCESS FOR EXTRUDING HIGH MOLECULAR WEIGHT, HIGH DENSITY LINEAR ETHYLENE POLYMERS TO FORM HEAVY TUBULAR MEMBERS

Michael Hirschberger, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 11, 1985, Ser. No. 743,444

Int. Cl.[4] B29C *47/06, 49/04*

U.S. Cl. 264—514 **13 Claims**

1. In a process for extruding a first high molecular weight, high density linear ethylene polymer through an annular die to form a heavy tubular shaped member weighing at least about 0.9 gms/linear cm at a temperature and a shear rate such that an extrudate prepared solely therefrom would exhibit melt fracture; the improvement which comprises eliminating said melt fracture by coextruding a thin layer of a second ethylene polymer in contact with said first high molecular weight, high density linear ethylene polymer, said layer of said second ethylene polymer also being extruded in contact with the wall of said annular die; said second ethylene polymer having melt flow properties such that it does not exhibit melt fracture at the temperature and shear rate employed in extruding said tubular shaped member; said first ethylene polymer having a Normal Load Melt Index (ASTM 1230 - Condition E) of 0.04–0.20 gms/10 min., a High Load Melt Index (ASTM 1230 - Condition F) of 4–20 gms/10 min., a density of at least about 0.94 gm/ml and a weight average molecular weight of at least about 200,000; and said second ethylene polymer having a Normal Load Melt Index (ASTM 1230 - Condition E) greater than 0.20 gms/10 min.

8. A process for blow molding containers which consists essentially of:

(a) extruding a layered parison weighing at least about 0.9 gm/linear cm and having an inner layer of a first ethylene polymer and an outer layer of a second ethylene polymer;

(b) clamping the parison of step (a) in a mold; and

(c) blowing the clamped parison of step (b) to form a container;

said first ethylene polymer being a high molecular weight, high density linear ethylene polymer having a Normal Load Melt Index (ASTM 1230 - Condition E) of 0.04–0.20 gms/10 min., a High Load Melt Index (ASTM 1230 - Condition F) of 4–20 gms/10 min., a density of at least about 0.94 gm/ml and a weight average molecular weight of at least about 200,000; said second ethylene polymer having a Normal Load Melt Index (ASTM 1230 - Condition E) greater than 0.20 gm/10 min. and a melt viscosity lower than the melt viscosity of said first ethylene polymer; the polymer temperature and the extrusion rate in step (a) being such that, if the parison consisted solely of the first ethylene polymer, the parison would exhibit melt fracture, but being such that the layered parison does not exhibit melt fracture.

4,622,200

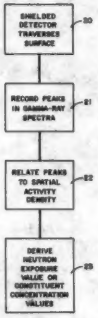
NON-DESTRUCTIVE METHOD FOR DETERMINING NEUTRON EXPOSURE AND CONSTITUENT CONCENTRATIONS OF A BODY

Raymond Gold, and William N. McElroy, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 547,681, Jan. 1, 1983, abandoned. This application Feb. 22, 1984, Ser. No. 582,510

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—159 **10 Claims**



4. A portable non-destructive method for determination of the neutron exposure to which a selected surface area on a object has been subjected, comprising the following steps:

exposing the solid state lithium-drifted silicon detector of a Compton Recoil Gamma-Ray Spectrometer to a limited portion of the surface area of the object through a small diameter collimator opening directed toward the surface area;

electronically measuring the continuous spectrum of detected gamma-rays at different energy levels during a first traverse of the surface area by the shielded detector;

recording a first flux density peak value of the gamma-rays at a selected energy level characteristic of neutron exposure;

identifying a first relationship between the first flux density peak value and the spatial activity density value for the measured gamma-rays;

modifying the exposure of the detector to the surface area;

electronically measuring the continuous spectrum of detected gamma-rays at different energy levels during a second traverse of the surface area by the detector;

recording a second flux density peak value of the gamma-rays at the previously selected energy level;

identifying a second relationship between the second flux density peak value and the spatial activity density value;

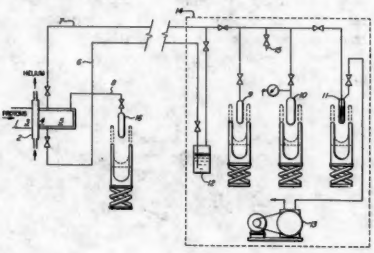
solving the first and second relationships to identify the spatial activity density value of the gamma-rays at the characteristic energy level; and

subsequently deriving information concerning spatial and angular neutron exposure of the object by known relationships to the identified spatial activity density value.

4,622,201
GAS-TARGET METHOD FOR THE PRODUCTION OF IODINE-123

Robert Robertson, Vancouver, and Donald C. Stuart, Ottawa, both of Canada, assignors to Atomic Energy of Canada Ltd., Ottawa, Canada

Filed Aug. 18, 1982, Ser. No. 409,376
Claims priority, application Canada, Jun. 1, 1982, 404175
Int. Cl.[4] G21G *1/10*
U.S. Cl. 376—192 **7 Claims**



1. A method of indirectly producing high-purity radioactive iodine-123 by means of the decay of 123-chain precursors thereof, said method comprising the steps of:

providing a gas-target assembly containing xenon gas enriched in the xenon-124 isotope, said gas target assembly having a deposit region on its interior surface for deposition of iodine-123,

providing at least one gas decay vessel having at least one further deposit region located therein, said gas decay vassel being remotely disposed from the gas-target assembly,

performing the following steps during a first predetermined period:

bombarding the gas within the gas-target assembly with a beam of protons of incident energy in the range of 45 MeV to 15 MeV to produce build-ups of both iodine-123 and xenon-123, and depositing the iodine-123 on said deposit region in the gas-target assembly;

transferring the irradiated xenon gas from the gas-target assembly to said gas decay vessel at the termination of said first predetermined period; and, during a second predetermined period, performing the following steps:

retaining the irradiated xenon gas in said decay vessel while the xenon-123 therein decays to iodine-123 and,

washing said gas target assembly deposit region with a liquid to recover therefrom the iodine-123.

4,622,202
REACTOR IN-VESSEL SENSOR AND CORE MONITORING APPARATUS

Izumi Yamada, Ibaraki; Hajime Yamamoto, and Mikiyasu Tsunashima, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

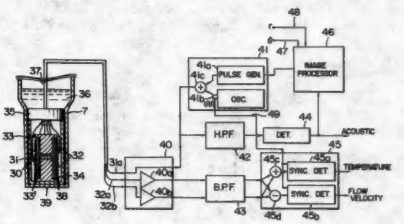
Filed Aug. 2, 1983, Ser. No. 519,698
Claims priority, application Japan, Aug. 25, 1982, 57-147097
Int. Cl.[4] G21C *17/00*; G01R *33/00*
U.S. Cl. 376—246 **10 Claims**

5. An apparatus for monitoring the interior of a fast breeder reactor comprising:

a monitoring sensor comprising a magnetic core member including a magnetostrictive or piezoelectric vibrator element in a portion thereof, a primary coil excited by an alternating current, a plurality of secondary coils electromagnetically coupled to said primary coil, said primary and secondary coils surrounding said magnetic core member, and a casing enclosing therein said magnetic core member and said primary and secondary coils;

filter means for filtering, in response to the application of AC voltages induced in said secondary coils, to reduce frequency components except that having the frequency of said AC voltages;

signal computer means for executing the addition and subtraction of output signals from said filter means; and

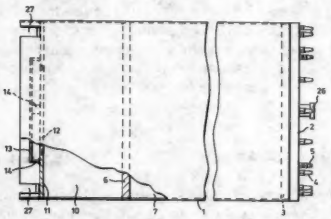


second filter means for filtering, in response to the application of a voltage induced in said primary coil, to reduce the frequency component of said AC voltages from said voltage signal applied from said primary coil.

4,622,203
CONTAINER FOR IRRADIATED NUCLEAR FUEL

Glenn Ellcock, Ellesmere Port, England, assignor to British Nuclear Fuels Limited, Warrington, England

Filed Sep. 20, 1982, Ser. No. 420,348
Claims priority, application United Kingoom, Oct. 26, 1981, 8132241
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—272 **7 Claims**

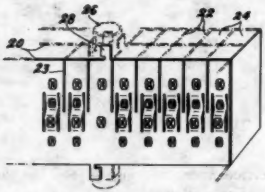


1. A multi-element bottle constructed and arranged for receiving, storing and transporting irradiated nuclear fuel in water, and for housing within a water-containing flask for transport of the bottle and nuclear fuel contents, said bottle comprising an elongate vessel, means dividing the vessel internally into at least two axially spaced chambers, a first of said chambers including means forming a number of compartments constructed and arranged for receiving and storing nuclear fuel assemblies in the first chamber, a removable lid at one end of the vessel closing the first chamber, a second of said chambers constituting an ullage compartment isolated in fluid tight manner from said first chamber by said dividing means, a closure wall at the other end of said vessel closing said second chamber, at least part of said closure wall comprising means for rupturing inwardly to open said ullage compartment to the exterior of said vessel when the pressure exterior of said second chamber and acting against said closure wall exceeds a predetermined value, whereby said vessel can be housed in a water-containing transport flask and said ullage compartment is available to reduce pressure within said flask when the flask pressure, and hence the pressure external of said vessel, exceeds said predetermined value, wherein said compartments include neutron absorbing material.

4,622,204
SPACER GRID FOR NUCLEAR REACTOR FUEL ASSEMBLY

Claude Feutrel, Vauhallan, France, assignor to Commissariat a l'Energie Atomique, France

Continuation of Ser. No. 457,438, Jan. 12, 1983, abandoned. This application Apr. 8, 1985, Ser. No. 720,655
Claims priority, application France, Jan. 20, 1982, 82 00834
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—442 3 Claims



1. A spacer grid for a nuclear reactor fuel assembly, comprising an assembly of two families of thin partitions which are respectively parallel in each family and perpendicular from one family to the next and which bound pockets of square section having four walls, each partition being entirely made of a zirconium alloy, two longitudinal parallel slots being provided in each wall to define a resilient sheet metal tongue in each of said four walls, a pair of rigid bosses on each tongue, said bosses on a tongue being oppositely directed in two adjacent pockets, each tongue extending continuously from its bosses along a line parallel to said slots to integrally join one of said four walls at two opposite ends, a pair of rigid bosses forming fuel rod bearing points produced directly in each of the four walls of a pocket and being oppositely directed in two adjacent pockets, the reaction of fuel rods on the bosses on the tongues after they have been positioned in the grid produces a torque between the opposite ends of the resilient sheet metal tongues, the deformation of the tongues thus enabling the assembly tolerances of the fuel rods to be absorbed in the grid.

4,622,205
ELECTROMIGRATION LIFETIME INCREASE OF LEAD BASE ALLOYS

David P. Fouts, Stanfordville; Devandra Gupta, Ossining; Paul S. Ho, Chappaqua; Jasvir S. Jaspal, Poughkeepsie; James R. Lloyd, Jr., Fishkill; James M. Oberschmidt, Poughkeepsie; Kris V. Srikrishnan, Wappingers Falls, and Michael J. Sullivan, Red Hook, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,631
Int. Cl.[4] C22C *11/06*
U.S. Cl. 420—566 12 Claims

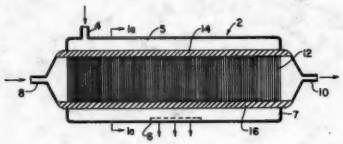
1. A method for reducing electromigration activity in terminations including lead-base/tin alloys evaporated onto ball limiting metallurgy formed of copper containing alloys comprising adding a solute element to the said lead-base/tin alloy in an amount of at least about 0.5%, the solute element being selected from the group consisting of copper, silver, gold and the rare earth elements.

4,622,206
MEMBRANE OXYGENATOR AND METHOD AND APPARATUS FOR MAKING THE SAME

William L. Torgeson, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Nov. 21, 1983, Ser. No. 553,854
Int. Cl.[4] A61M *1/03*
U.S. Cl. 422—48 31 Claims

1. A membrane oxygenator comprising
a housing,
a plurality of microporous hollow fibers disposed within said housing for transporting a first fluid therethrough,
first inlet means in communication with said fibers for delivering said first fluid thereto,
first outlet means in communication with said fibers for receiving said first fluid therefrom,
second inlet means and second outlet means in communication with the regions disposed exteriorly of said hollow fibers,
said second inlet means being so disposed with respect to said second outlet means that a second fluid flowing through said housing will flow in a direction generally transverse to the axial extent of said hollow fibers,
said hollow fibers having a wall porosity of about 25 percent or greater,

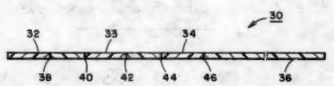


said fibers being disposed in a plurality of layers,
the spacing between said fibers within a said layer measured from center to center being about 1.5 to 4 times the external diameter of said fibers, whereby either gas or blood will be said first fluid and the one not so used will be said second fluid,
said first fluid is blood,
said first inlet means is blood inlet means,
said first outlet means is blood outlet means,
said second fluid is gas,
said second inlet is gas inlet means,
said second outlet is gas outlet means, and
said fibers having an interior coating of a material which is oxygen and carbon dioxide permeable.

4,622,207
REAGENT TEST DEVICE HAVING SEALED MATRIX BOUNDARIES

Joseph Y. Wang, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 14, 1984, Ser. No. 681,790
Int. Cl.[4] G01N *33/52, 21/78*
U.S. Cl. 422—56 6 Claims



1. A reagent test device comprising a strip of hydrophobic open celled natural or synthetic material having opposing upper and lower planar, parallel sides, and cell openings at spaced locations along the strip of material being sealed to form matrix boundaries thereby defining reagent impregnated carrier matrices having parallel surfaces composed of the parallel upper and lower sides of said material, whereby the reagent carrier matrices and the material have the same thickness.

5. Process of forming a reagent test device having opposite planar, parallel sides and multiple reagent matrices from a length of hydrophobic open celled natural or synthetic material having a thickness of 50 to 1,000 microns in which the pore size of the open cells is between 0.5 and 100 microns comprising heating the hydrophobic open celled material along lines perpendicular to the length of the test device to close the cells where heat is applied and thereby form matrix boundaries

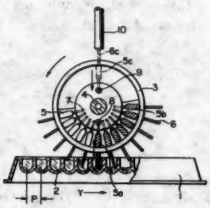
sealing each adjacent reagent matrix area and impregnating said sealed reagent matrices with reactive ingredients, whereby said sealed reagent matrices and the material have the same thickness.

4,622,208

OPTICAL CONTINUOUS MEASURING APPARATUS FOR REACTION-LIQUID

Yuzaburo Namba, Yatabe, and Toshio Takahashi, Honjo, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed May 3, 1985, Ser. No. 730,035
Claims priority, application Japan, May 11, 1984, 59-94244
Int. Cl.[4] G01N *21/05, 35/06*
U.S. Cl. 422—65 **7 Claims**



1. An optical continuous measuring apparatus for reaction liquid comprising:

a plate-like member provided with a plurality of cavities for receiving a reaction-liquid, said plate-like member being movable in a first direction and a second direction, opposite to said first direction, said cavities being disposed linearly, parallel to said first direction and spaced apart from one another in said first direction by a predetermined uniform distance;

a first dirving means for intermittently moving said plate-like member by said predetermined uniform distance in said first direction;

a disk-shaped rotary member, having front and back side surfaces, a periphery and an axis of rotation transverse to said first direction, provided over said platelike member so as to be rotatable in said first direction;

a plurality of transparent measuring cells receivable of said reaction liquid, each cell having an inlet and an outlet, radially disposed on said rotary member, said inlets being disposed radially outwards of said outlets:

a plurality of suction nozzles projecting radially outward from said rotary member, each suction nozzle corresponding to a respective measuring cell and having a first end and a second end, said second ends being disposed radially inwards of said first ends and being in fluid communication with said inlet of said respective measuring cell, said first ends being circumferentially spaced apart from each other by a distance substantially equal to or slightly greater than said predetermined uniform distance, said first ends being receivable within respective cavities of said plurality of cavities in said plate-like member;

a second driving means for intermittently rotating said rotary member in said first direction such that each of said first ends of said plurality of suction nozzles move a circumferential distance substantially equal to said predetermined uniform distance, said second driving means cooperating with said first driving means so that upon intermittent rotation of said rotary member in said first direction each of said suction nozzles is in turn received within a respective one of said cavities as said plate-like member is intermittently moved in said first direction;

suction means, selectively connectable to said measuring cells, for applying a negative pressure to the outlet of the measuring cell corresponding to the suction nozzle whose first end is received within said respective cavity so as to draw reaction liquid into said measuring cell;

measuring means for optically measuring the reaction liquid received in said measuring cell;

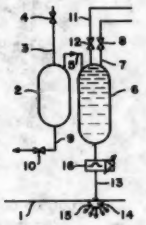
a rinsing liquid supplying/discharging means, connectable to said measuring cells, for supplying a rinsing liquid to said measuring cells and discharging said rinsing liquid from said measuring cells.

4,622,209

PROCESS AND APPARATUS FOR REDUCING THE CHANCES OF IGNITION AND EXPLOSION DUE TO THE DECOMPOSITION OF HIGH-PRESSURE INDUSTRIAL PROCESS GASES

Alain Nardi, Bolbec, and Jean-Nöel Simier, Lillebonne, both of France, assignors to Societe Chimique des Charbonnages-CdF Chimie, Paris, France

Filed Apr. 25, 1980, Ser. No. 143,636
Claims priority, application France, Apr. 25, 1979, 79 100444
Int. Cl.[4] A62C *3/00*
U.S. Cl. 422—112 **6 Claims**



1. An apparatus for reducing the risk of exposion upon evacuation of decomposition gases contained in a high-pressure vessel to an evacuation circuit comprising:

(a) means for containing an inert gas at a pressure, P, between about 5 and 50 bars and an inert liquid of high heat of vaporization;

(b) an airtight evacuation circuit into which said decomposition gases issuing from said high-pressure vessel are evacuated;

(c) a connecting pipe of length L_o and cross-section S_o in flow communication with said means for containing said inert gas and liquid and said evacuation circuit;

(d) inert liquid dispersing means for dispersing said inert liquid in said evacuation circuit within 20 milliseconds of activation, located at an end of said connecting pipe, and for delivering said inert liquid to said evacuation circuit at an initial flow rate, Q_o;

(e) valve means for opening within 5 milliseconds after activation of cross-section S_1 and length L_1, located within said connecting pipe; and

(f) means for operating said valve means responsive to the pressure in said evacuation circuit.

4,622,210

SULFUR OXIDE AND PARTICULATE REMOVAL SYSTEM

Eugene H. Hirschberg, Park Forest, and Carl J. Horecky, Elmhurst, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

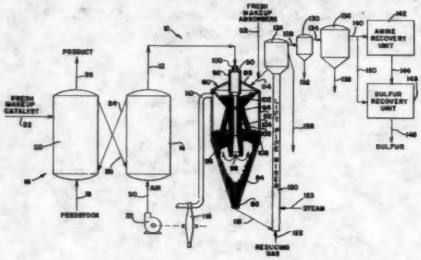
Filed Aug. 13, 1984, Ser. No. 640,674
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.[4] B01D *50/00*; B01J *8/12*
U.S. Cl. 422—144 **12 Claims**

1. A gas purification system, comprising:

a vessel comprising a housing defining and positioned about a vertical axis, a plurality of conduits connected to and

communicating with said housing, said conduits including a gas inlet, a gas outlet, an adsorber inlet and an adsorber outlet, said gas inlet comprising a downwardly facing gas inlet being positioned at an angle of inclination ranging from about 30° to about 90° relative to a horizontal axis for feeding and directing the flow of influent gases generally downwardly through said housing, an annular frustoconical adsorber collection reservoir positioned within said housing, said reservoir having flared sidewalls extending below the height of said gas inlet, and discharge chutes communicating with said reservoir comprising substantially symmetrical inclined chutes extending downwardly and outwardly from said reservoir at an angle of inclination relative to said vertical axis in a direction away from said gas inlet;

sulfur oxide and particulate removal balls located in said reservoir, inclined chutes, and housing for simultaneously



removing a substantial portion of particulates and sulfur oxides from a gaseous stream in said housing, said sulfur oxide and particulate removal balls entering and exiting said housing through said absorber inlet and absorber outlet, respectively; and

said sulfur oxide and particulate removal balls including a bed of sulfur oxide-capturing and particulate-removing balls selected from the group consisting essentially of adsorbers and adsorbers with at least one promoter thereon, said adsorbers being substantially present in the absence of a carbonaceous aggregate and comprising an oxide of at least one metal selected from the group consisting of aluminum, bismuth, manganese, yttrium, antimony, tin, a rare earth metal, a Group 1a metal, and a Group 2a metal, and said promoter selected from the group consisting essentially of a rare earth metal, a Group 8 metal, chromium, vanadium, rhenium, and combinations thereof.

4,622,211

APPARATUS FOR SOLIDIFICATION WITH RESISTANCE HEATER AND MAGNETS

Toshihiko Suzuki; Nobuyuki Isawa; Yasunori Ohkubo, and Kinji Hoshi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

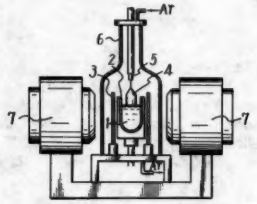
Division of Ser. No. 339,065, Jan. 13, 1982, which is a continuation of Ser. No. 188,519, Sep. 18, 1980, abandoned. This application Dec. 16, 1983, Ser. No. 562,015

Claims priority, application Japan, Sep. 20, 1979, 54-121339; Jan. 28, 1980, 55-8576; Jan. 28, 1980, 55-8577; Jan. 28, 1980, 55-8578

Int. Cl.[4] C30B *35/00*

U.S. Cl. 422—248 **5 Claims**

1. An apparatus for solidification comprising, a container made of an electrical insulator for a liquid material to be solidified, an electric resistance heater around said container energized to melt said liquid material, a pair of magnets beside said container producing a stationary magnetic field, a source of electricity to supply DC current with ripple components less



than 4% and to eliminate strong vibration to said heater and means for pulling a solid crystal from said liquid material.

4,622,212

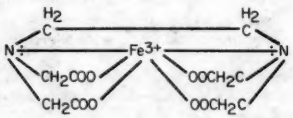
HYDROGEN SULFIDE REMOVAL

Derek McManus, Palatine, and Frederick R. Kin, Park Forest, both of Ill., assignors to ARI Technologies Inc., Palatine, Ill.

Continuation of Ser. No. 548,294, Nov. 3, 1983, abandoned. This application Jun. 25, 1985, Ser. No. 748,148

Int. Cl.[4] C01B *17/16*

U.S. Cl. 423—226 **40 Claims**



1. A method of preventing excessive degradation of chelating agent during prolonged continuous operation of a hydrogen sulfide removal process using a chelated polyvalent metal catalyst solution wherein an aqueous solution of a polyvlent metal chelated with at least one chelating agent comprising an aminopolycarboxylic acid is contacted with a hydrogen sulfide-containing fluid stream to effect oxidation of the hydrogen sulfide to elemental sulfur and concomitant reduction of said polyvalent metal from its higher valence state to its lower valence state, and wherein the catalyst solution is regenerated by contacting said solution with an oxygen-containing gas to oxidize said polyvalent metal from its lower valence state to its higher valence state, and wherein said chelating agent is susceptible to rapid progressive degradation by rupture of nitrogen-carbon bonds during the process, thereby necessitating addition of replacement chelating agent,

said method comprising the steps of:

incorporating in said catalyst solution an effective concentration of a stabilizing agent sufficient to retard the rate of degradation or to prevent degradation of said aminopolycarboxylic acid chelating agent during operation of the process, said stabilizing agent being selected from the group consisting of alkaline thiosulfates and dihydroxy alcohols having 2 to 3 carbon atoms; and

maintaining said effective concentration of said stabilizing agent in said catalyst solution substantially throughout the operation of the process for at least about 170 hours by incorporating additional amounts of stabilizing agent in said solution or withdrawing used solution if and when required.

4,622,213

SULFUR DIOXIDE REMOVAL FROM GAS STREAMS

Peter Urban, and Edward A. Ginger, both of Northbrook, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sep. 9, 1985, Ser. No. 773,686
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—242 16 Claims

1. A process for removal of sulfur dioxide pollutant gas from a gas stream which comprises contacting said gas stream with pretreated shale in the form of an aqueous solution of aluminum sulfate including from about 0.1 to about 2.0% by weight of said pretreated shale, the pretreatment of said shale comprising the heating of said shale in the presence of a gas unable to support combustion at a temperature in a range of from about 340° C. to about 480° C.

4,622,214

METHOD FOR THE PREPARATION OF CRYSTALLINE MOLECULAR SIEVE MATERIALS WHEREIN THE ORGANIC TEMPLATE IS AN ENANTIOMER

Alan E. Comyns, Chester; Gareth W. Morris, Wirral, and John P. Sankey, Great Sankey Warrington, all of England, assignors to Laporte Industries Limited, London, England

Filed Nov. 8, 1985, Ser. No. 796,193
Claims priority, application United Kingdom, Nov. 17, 1984, 8429121; Apr. 2, 1985, 8508619
Int. Cl.[4] C01B *35/10*
U.S. Cl. 423—277 5 Claims

1. A process for the production of a synthetic crystalline molecular sieve material by the use of a reaction mixture containing an organic template material characterised in that the template is an enantiomer.

4,622,215

PROCESS FOR PREPARING FINE GRAIN TITANIUM CARBIDE POWDER

Mark A. Janey, Concord, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 12, 1985, Ser. No. 710,881
Int. Cl.[4] C01B *31/30*
U.S. Cl. 423—440 6 Claims

1. A method for preparing titanium carbide powder of a purity greater than 99.9% in a submicron particle size range, comprising the steps of forming a mixture consisting essentially of a liquid organotitanate or an organotitanate in a solution and a solution of a carbon precursor polymer with the organotitanate and the carbon precursor polymer being in essentially stoichiometric concentrations with respect to titanium and carbon and with the organotitanate providing a crosslinking reaction with the carbon precursor polymer for forming a gel, heating the gel to successively dry the gel, drive volatile components from the gel and pyrolyze the polymer to form free carbon, and thereafter heating the remaining components of the gel to a temperature sufficient to convert the titanium and carbon to titanium carbide powder.

4,622,216

TREATMENT OF SODIUM DITHIONITE REACTION MIXTURE

Charles E. Winslow, Jr., Norfolk; Joseph L. Bush, and Daniel D. Dickens, both of Chesapeake, all of Va., assignors to Virginia Chemicals, Inc., Portsmouth, Va.

Filed Aug. 6, 1985, Ser. No. 762,839
Int. Cl.[4] C01B *17/66*
U.S. Cl. 423—515 7 Claims

1. In the process for producing anhydrous dithionites which comprises supplying a plurality of feeds, comprising methanol, methyl formate, sulfurous acid anhydride, an alkali hydroxide, an alkali formate, and water, heating said feeds to reaction temperature within a reaction vessel and forming dithionite crystals in a mother liquor, filtering said dithionite crystals from the mother liquor, washing the dithionite crystals with an organic solvent as a washing liquid under conditions which do not cause a slurry to form, and drying the dithionite crystals;

the improvement comprising adding to said reaction vessel, at least one compound selected from the group consisting of the compounds represented by Formulas I and II; wherein Formula I is

wherein R_1 is hydrogen, an alkyal group containing from 1 to 8 carbon atoms, a halogenated alkyl group containing from 1 to 2 carbon atoms, a phenyl group or a substituted phenyl group; and Formula II is

$$R_2\text{—}X \text{ or } XR_2X,$$

wherein R_2 is a primary or secondary alkyl group containing lrom 1 to 8 carbon atoms, an allyl group, or a 2-methylallyl or 2-ethylallyl group, and X is halogen, in an amount sufficient to provide an effective amount of said compound in said reaction vessel during said sodium dithionite producing process to convert said thiosulfate and other unidentified sulfur compounds, which form as byproducts in the reaction, into substances which do not exert an adverse influence on the production of dithionites.

4,622,217

I-4-AMINO-3-IODOBENZYLGUANIDINE AS IMAGING AND THERAPEUTIC AGENT

Donald M. Wieland, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Apr. 27, 1984, Ser. No. 604,383
Int. Cl.[4] G01N *43/00, 49/00*
U.S. Cl. 424—1.1 22 Claims

12. A method of radio-imaging a human organ comprising the steps of:

(a) systemically applying a pharmaceutical composition comprising radioiodinated 4-amino-3-iodobenzylguanidine to a human;

(b) detecting gamma radiation emitted by said composition and forming an image therefrom.

4,622,218

TESTICULAR-SPECIFIC DRUG DELIVERY

Nicholas S. Bodor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 379,316, May 18, 1982, Pat. No. 4,479,932. This application Mar. 15, 1983, Ser. No. 475,493
Claims priority, application Japan, Jun. 14, 1982, 57-101940
The portion of the term of this patent subsequent to Oct. 30, 2001, has been disclaimed.
Int. Cl.[4] A61K *49/00, 31/455, 33/44, 31/47*; C07J *1/00*; C01G *41/06*; C07C *87/28*; C07D *239/02*
U.S. Cl. 424—9 37 Claims

1. A method for site-specifically and sustainedly delivery a testicularly acting drug species to the testes, comprising administering to a male mammal in need of such treatment a quantity of a compound having the formula

[D—DHC] (I)

or a non-toxic pharmaceutically acceptable salt thereof, wherein [D] is testicularly acting drug species and [DHC] is the reduced, biooxidizable, lipoidal form of a dihydropyridine⇄pyridinium salt redox carrier, said redox carrier facilitating the transport of said testicularly acting drug species across the blood-testis barrier and delivering said testicularly acting drug species to the testes in a site-specific and sustained manner, said quantity being sufficient to deliver a testicularly,

pharmacologically effective amount of said testicularly acting drug species to the testes.

4,622,219

METHOD OF INDUCING LOCAL ANESTHESIA USING MICRODROPLETS OF A GENERAL ANESTHETIC

Duncan H. Haynes, 4051 Barbarossa Ave., Miami, Fla. 33133

Filed Jun. 17, 1983, Ser. No. 505,326
Int. Cl.[4] A61K *9/10, 9/52*
U.S. Cl. 424—38 3 Claims

1. A method of inducing local anesthesia in a subject in need of same comprising administering intradermally or intramuscularly in the area of the subject in which local anesthesia is desired a local anesthesia-inducing amount of microdroplets of a general anesthetic consisting of a fluoro-chloro-hydrocarbon in liquid form which is stabilized against coalescence and surrounded by a unimolecular phospholipid layer said microdroplets being from about 200 Angstroms up to 10,000 Angstroms in diameter.

4,622,220

PREPARATION FOR ORAL HYGIENE

Franz Frosch, Taunusstein, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider, Mainz, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,582
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1984, 3406005; Sep. 5, 1984, 3432571
Int. Cl.[4] A61K *7/16*
U.S. Cl. 424—49 9 Claims

1. A toothpaste composition effective against the formation of dental plaque containing from 0.05 to 5% by weight, based on the total weight of the composition, of a member selected from the group consisting of zinc aspartate, copper aspartate and mixtures thereof.

4,622,221

METHOD, COMPOSITIONS AND COMPOUNDS, USEFUL IN ROOM FRESHENERS EMPLOYING CYCLOHEXYL ALCOHOL AND ESTER DERIVATIVES

Alfred A. Schleppnik, St. Louis, Mo., assignor to Bush Boake Allen Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 352,642, Feb. 26, 1982, abandoned, and Ser. No. 352,643, Feb. 26, 1982, abandoned, and a continuation of Ser. No. 102,383, Nov. 12, 1979, abandoned, which is a continuation of Ser. No. 936,296, Aug. 23, 1978, abandoned, which is a division of Ser. No. 640,614, Dec. 15, 1975, abandoned, said Ser. No. 352,642, is a continuation of Ser. No. 127,658, Mar. 6, 1980, abandoned, which is a continuation of Ser. No. 761,750, Jan. 24, 1977, abandoned, which is a division of Ser. No. 628,855, Nov. 5, 1975, abandoned, said Ser. No. 127,658, is a continuation of Ser. No. 628,855, Nov. 5, 1975. This application Feb. 21, 1984, Ser. No. 581,772
Int. Cl.[4] A61L *9/01, 9/04*
U.S. Cl. 424—76 10 Claims

1. A method of counteracting a malodor in the air caused by a compound selected from the group consisting of lower carboxylic acids, thiols, thiophenols, phenols, lower amines, phosphines and arsines which comprises introducing into the air an effective malodor counteracting amount of cyclohexyl-1-ethyl-n-butyrate whereby the perceived total odour intensity in the air is reduced and the perceived malodor intensity in the air is substantially eliminated.

4,622,222

PROCESS FOR THE PREPARATION OF A LYOPHILIZED VACCINE AGAINST DUCK VIRUS HEPATITIS

Erzsébet Horváth, Budapest, and Gábor Tollas, Gödöllö, both of Hungary, assignors to Phylaxia Oltoanyagtermelo Vallalat, Budapest, Hungary

Filed Dec. 14, 1982, Ser. No. 449,745
Claims priority, application Hungary, Dec. 23, 1981, 3935/81
Int. Cl.[4] A61K *39/12;* C12N *7/00*
U.S. Cl. 424—89 3 Claims

1. A process for the preparation of a lyophilized vaccine against duck hepatitis comprising the steps of:

(a) injecting a hepatitis virus TN as deposited in the Strain Collection of the Hungarian Institute of Public Health under No. 00220, into the allantoic cavity of embryonated SPF hen eggs;

(b) incubating the eggs at a temperature of about 37° C.;

(c) collecting the embryos dying between 24 and 96 hours from the start of incubation;

(d) discarding the embryos dying prior to 24 and subsequent to 96 hours form the start of incubation;

(e) homogenizing the collected embryos in physiological saline solution to form a suspension;

(f) centrifuging the suspension;

(g) adding to the suspension an antibiotic selected from the group consisting of penicillin, streptomycin, chloramphenicol, neomycin, gentamycin, and mixtures thereof in an amount sufficient to sterilize said suspension, and adding to the suspension a protective skeleton-forming agent consisting essentially of:

5% of collidone solution,

5% of gelatin solution,

4% of glucose solution, and

3% of sucrose solution, so that the total quantity of the protective skeleton-forming agents in the suspension is 17% by weight; and

(h) lyophilizing the resulting composition.

4,622,223

BROAD SPECTRUM VACCINE AGAINST GONORRHEA

Gary K. Schoolnik, Palo Alto, and Jonathan Rothbard, San Francisco, both of Calif., assignors to The Board of Trustees for the Leland Stanford University, Palo Alto, Calif.

Continuation-in-part of Ser. No. 623,178, Jun. 21, 1984, Pat. No. 4,584,195. This application Jul. 25, 1985, Ser. No. 759,123
Int. Cl.[4] A61K *39/095;* C07K *7/06, 7/08*
U.S. Cl. 424—92 16 Claims

1. A vaccine protective against gonorrhea which comprises an effectively protective amount of a peptide wherein the only antigenic determinant is an amino acid sequence that corresponds to residues 21–35, 48–60, 107–121, 135–151 or 151–159 inclusive of *N. gonorrhoeae* MS11(Tr) pilin linked to a substantially antigenically neutral carrier.

4,622,224

PREPARATION OF WORT EXTRACTS

Joseph L. Owades, 3097 Wood Valley Rd., Sonoma, Calif. 95476

Filed Aug. 27, 1984, Ser. No. 644,805
Int. Cl.[4] C12C *11/04, 9/00*
U.S. Cl. 426—16 11 Claims

1. In a method for producing a wort in which a warm malt mash is blended with hot water at a temperature above 75° C., the improvement which comprises blending said warm malt mash and hot water under conditions which avoid exposing the blend of hot water and the malt mash to temperatures between about 52° C. and about 75° C. so as to avoid appreciable conversion of the blended malt mash to simple sugars.

4,622,225

METHOD OF PREPARING YEAST-LEAVENED BREAD CRUMBS

Chia-Chi Tu, Danville, Calif.; Ronald P. Wauters, Brookfield, Conn., and Ralph E. Kenyon, Belle Mead, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 4, 1985, Ser. No. 795,025
Int. Cl.[4] A21D *13/00*
U.S. Cl. 426—27 9 Claims

1. A method of preparing yeast-leavened bread crumbs suitable for use in a stuffing mix comprising:

providing a fully developed, yeast-leavened bread dough, said bread dough being made from a bread-making formulation containing flour, yeast, and about 50% to 60% by weight water based on the weight of the flour;

allowing the dough to rest for a time sufficient to enable the dough to withstand physical shaping during sheeting without tearing;

sheeting the dough to form a dough sheet having a thickness of about ¼ inch to ¾ inch;

proofing the dough sheet for a time sufficient to provide a baked bread sheet having a density of from 17 to 36 pounds per cubic foot;

baking the dough sheet at an initial temperature which is sufficiently high and for a period of time effective to kill the yeast within said dough while additionally preventing substantial rising of the dough during said baking, thereafter continuing the baking until the bread dough is fully baked, thereby producing a baked bread having a density within the range of about 17 to 36 lbs./cubic foot;

cooling the baked bread sheet to ambient temperature;

staling the cooled bread sheet for a maximum of ten hours;

dividing the staled bread sheet into bread crumbs having a size suitable for use as a stuffing mix; and

drying the bread crumbs to a moisture content of not more than 15% by weight.

4,622,226

MODIFIED PUFF PASTRY AND PROCESS FOR PREPARING THE SAME

Victor H. Ke, Grand Prairie, and Regina A. Brown, North Richland Hills, both of Tex., assignors to Frito Lay, Inc., Dallas, Tex.

Filed Apr. 29, 1985, Ser. No. 728,214
Int. Cl.[4] A21D *13/08*
U.S. Cl. 426—94 28 Claims

1. A process for producing a puff pastry having improved texture comprising baking a multi-layered laminate of dough and roll-in shortening wherein a dextrin is partially substituted for the flour used to make the dough.

4,622,227

ACIDULENT COMPRISING FUMARIC ACID AND DRIED NATURAL JUICE SOLIDS

Fouad Z. Saleeb, Pleasantville, N.Y., and Randal P. McKay, Paramus, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 26, 1985, Ser. No. 769,513
Int. Cl.[4] A23L *1/22, 1/223, 1/235*
U.S. Cl. 426—96 21 Claims

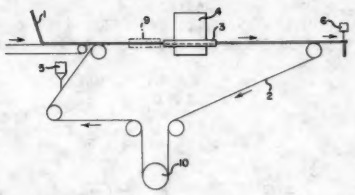
1. A co-dried particulate acidulent comprising fumaric acid in an amount of at least 50% by weight and natural juice solids in an amount of at least 5% by weight.

4,622,228

PROCESS AND APPARATUS FOR PRODUCING FOOD PRODUCT

Hiroji Ikeuchi, and Kiyoaki Ikeuchi, both of Akashi, Japan, assignors to Kabushiki Kaisha Ikeuchi Tekkosho, Akashi, Japan

Filed Aug. 26, 1985, Ser. No. 769,175
Int. Cl.[4] A23L *3/22, 1/27;* A23P *1/00*
U.S. Cl. 426—241 8 Claims



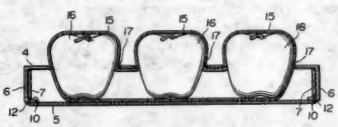
1. A method of producing an elongated food product comprising the steps of heating, shaping and solidifying a paste food product to form an elongated length of solidified food product, placing the elongated length of solidified food product on a generally flat moving belt, forming a portion of said belt into a cylinder by a plurality of sets of rollers so as to envelop said elongated food product, moving said portion of said belt and said elongated food product therein into a tube, heating said elongated food product while it is in said tube, and then removing said elongated food product from said tube and said belt.

4,622,229

PROCESS FOR PRESERVING APPLES IN A PACKAGE CONTAINING AN ETHYLENE ABSORBENT AND DEOXIDANT

Kitayama Toshitsugu, Kuroishi, Japan, assignor to Kyoei Co., Ltd., Japan

Filed May 16, 1985, Ser. No. 734,908
Claims priority, application Japan, May 21, 1984, 59-101898; Jul. 25, 1984, 59-113277
Int. Cl.[4] A23B *7/14, 7/148;* B65B *25/04;* B65D *81/18*
U.S. Cl. 426—395 4 Claims



1. A process for preserving apples comprising the steps of:

(a) providing a resilient bag for containing the apples;

(b) placing in the bag an ethylene absorbent and a deoxidant, each in an amount such that ethylene produced by the apples is absorbed and ethylene biosynthesis is suppressed for maintaining the freshness of the apples when the apples are placed within the bag;

(c) placing the apples within the bag;

(d) sealing the open portion of the bag containing the apples, the ethylene absorbent, and the deoxidant, the sealed bag allowing air to permeate therethrough to a degree such that the minimum amount of air necessary for the apples is supplied in the presence of the ethylene absorbent and the deoxidant;

(e) providing a case having a front plate, a rear plate and side walls, said front plate having a plurality of spaced openings of a size sufficient to allow said apples to go through;

(f) placing said sealed bag containing said applies, ethylene

absorbent, and deoxidant on said rear plate of said case; and

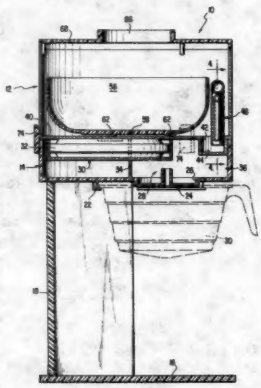
(g) covering said front plate of said case over said sealed bag and said rear plate so that the front plate depresses the bag between the apples towards the rear plate with resilient deformation so that each apple disposed in said bag partly projects from one of said openings respectively and is stationarily supported in said bag by the resilient deformation of the bag.

4,622,230

DISPLACEMENT TYPE COFFEE MAKER

Wayne B. Stone, Jr., Bethesda, Md., assignor to Wood Manufacturing Co., Inc., Flippin, Ark.

Filed May 15, 1985, Ser. No. 734,210
Int. Cl.[4] A47J *31/00*
U.S. Cl. 426—433 **12 Claims**



1. In combination with a coffee maker having a filter basket in spaced, overlying relation to a coffee pot support, the improvement comprising:

a water holding tank;

a buoyant water transfer tank within said holding tank;

means for introducing cold water to said holding tank via said transfer tank;

said means comprising metering means;

heating means for heating water in said holding tank; and

means for transferring hot water from said holding tank to said filter basket as a function of cold water inpour to said transfer tank.

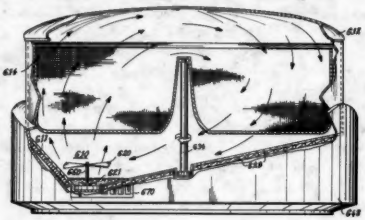
4,622,231

CONVECTION FOOD HEATING

John S. Swartley, Westport, Conn., assignor to Idea Network Company, Inc., Westport, Conn.

Continuation of Ser. No. 585,308, Mar. 1, 1984, Pat. No. 4,581,989, which is a continuation-in-part of Ser. No. 356,229, Mar. 8, 1982, Pat. No. 4,439,459. This application Oct. 3, 1985, Ser. No. 783,550
The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.
Int. Cl.[4] A23L *1/00*; A47J *37/00*
U.S. Cl. 426—438 **6 Claims**

1. A process for heating food which comprises: placing food on a foraminous support within a heating chamber; creating a flow of air about a heat source to increase the temperature thereof to a predetermined temperature sufficient to rapidly heat said food when admixed with a liquid heat exchange medium; circulating said air flow about the food within said chamber while introducing said heat exchange medium into said air flow in a quantity sufficient to thoroughly wet the surface of the food and to drip into a reservoir from which it can be recycled for redispersion into said air flow; collecting and reheating liquid heat exchange medium having dripped



from said food; redispersing said liquid heat exchange medium into said air flow; and continuously circulating the air containing a dispersed heat exchange medium between the food and said heat source for a period of time sufficient to heat said food.

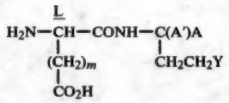
4,622,232

L-AMINODICARBOXYLIC ACID ALKANES

Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 730,975, May 6, 1985. This application Mar. 21, 1986, Ser. No. 842,347
Int. Cl.[4] A23L *1/236*
U.S. Cl. 426—548 **17 Claims**

1. A composition comprising an edible composition and a sweetening effective amount of a compound represented by the formula:



wherein

A is $-CO_2R$ in which R is alkyl containing 1–3 carbon atoms;

A' is hydrogen or alkyl containing 1–3 carbon atoms;

Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;

R_1 is alkyl-substituted cycloalkyl, or bicycloalkyl containing at least one alkyl in the β-position of the ring, containing up to 7 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 is H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;

n=0 or 1; and

m-0 or 1;

and food-acceptable salts thereof.

4,622,233

PREPARATION AND USE OF A HIGHLY PURIFIED POLYDEXTROSE

Anibal Torres, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Dec. 6, 1984, Ser. No. 678,610
Int. Cl.[4] A23L *1/09*
U.S. Cl. 426—548 **5 Claims**

1. A method for reducing the color, glucose content and anhydroglucose content of polydextrose Type A which comprises the steps of (1) contacting a 60–70% (W/W) aqueous solution of polydextrose Type A with a food approved bleaching agent at a temperature of 25°–90° C. and a pH of about 2.5 to about 9; (2) adjusting the pH of the product of step (1), if

above 7, to about 6; (3) adding one or more of the solvents selected from the group consisting of methanol, ethanol and ethyl acetate such that said solvent comprises 50–80% (W/W) of the mixture; (4) filtering the final product, and if desired, drying.

4,622,234

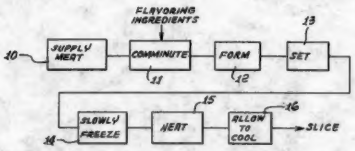
PROCESS FOR PREPARING A FISH MEAT PRODUCT

Minoru Okada, Tokyo, Japan, assignor to Suzuhiro U.S.A., Inc., Los Angeles, Calif.

Continuation of Ser. No. 503,518, Jun. 13, 1983, abandoned. This application Oct. 18, 1984, Ser. No. 662,082

Int. Cl.⁴ A23L *1/325*

U.S. Cl. 426—643 **5 Claims**



1. A process for producing an edible fish meat product, comprising the steps of:

(a) comminuting fish meat to form a paste mass at a temperature below 20° C. and above 0° C.,

(b) adding to the mass an amount of sodium chloride which is between 1.0 and 10.0 percent by weight of the mass, and molding the paste mass to abalone shape,

(c) subjecting the formed mass to a temperature or temperatures between 0° and 40° C. for between 10 and 60 minutes to cause the mass to set to an elastic gel,

(d) slowly freezing the set mass at a temperature or temperatures between −5° and −30° C. for between 15 and 24 hours to remove rubbery bite characteristics,

(e) thereafter immediately rapidly heating the frozen mass in a steam chamber to a temperature between 110° and 130° C. to effect sterilization of the mass,

(f) and then allowing the heated mass to cool and slicing the mass to form thin slices.

4,622,235

METHOD AND APPARATUS FOR GENERATING AN ELECTROSTATIC FIELD FOR FLOCKING A THREAD-LIKE OR YARN-LIKE MATERIAL, AND THE FLOCKED ARTICLE THUS PRODUCED

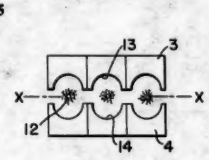
Robert L. Goerens, Esch/Alzette, Luxembourg, assignor to Uniroyal Englebert Textilcord S.A., Steinfort, Luxembourg

Filed Feb. 28, 1985, Ser. No. 706,638

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423462

Int. Cl.⁴ B05D *1/16*

U.S. Cl. 427—25 **19 Claims**



1. A method of generating an electrostatic field for electrostatically flocking a thread or yarn having a periphery and longitudinal axis extending in longitudinal direction and provided with an adhesive coating and grounded, and which is in a group of threads or yarn disposed parallel and spaced relative to each other and withdrawn from a spool means and rectilinearly subjected to a stretching means and moved through an electrical field of high voltage effective between the potential surfaces of electrodes spaced relative to each other; flock material being supplied via an electrically non-conductive conveying means which is disposed above a lower one of said electrodes, and below said group of threads or yarn; under the effect of said electrical field, said flock material via said electrically non-conductive conveying means being accelerated between the potential surfaces in a direction toward and being shot into said adhesive coating on the threads or yarn; the improvement therewith comprising the steps of:

providing said electrodes with curved potential surfaces relative to periphery of said threads or yarn and extending symmetrically about all of the longitudinal axis of the threads or yarn;

generating an electrical field, between said curved potential surfaces and transverse to the longitudinal direction of said threads or yarn; and

moving said threads or yarn rectilinearly and in the longitudinal direction thereof through said electrical field to thereby flock said threads or yarn symmetrically subjected to building up of the flock material all the way around periphery thereof.

4,622,236

BORON NITRIDE FILM AND PROCESS FOR PREPARING SAME

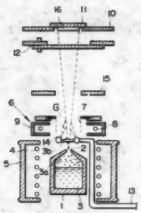
Kiyoshi Morimoto, Mobara, and Toshinori Takagi, Nagaokakyo, both of Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Division of Ser. No. 584,403, Feb. 28, 1984, Pat. No. 4,565,741. This application Sep. 23, 1985, Ser. No. 778,872

Claims priority, application Japan, Feb. 28, 1983, 58-30792

Int. Cl.⁴ C23C *15/00*

U.S. Cl. 427—38 **5 Claims**



1. A process for preparing a boron nitride film comprising the steps of:

heating boride charged in a closed-type crucible having at least one injection nozzle to form boron vapor;

ejecting said boron vapor through said nozzle into a nitrogen atmosphere having a pressure below 10^{-2} Torr and ionizing at least a part thereof; and

impinging said ionized boron vapor on the surface of a substrate together with nitrogen to form a boron nitride film on said substrate.

4,622,237

METHOD OF FLAME ACTIVATION OF SUBSTRATES

Giulio Lori, Via Lambruschini, 4-Terni, Italy

Filed Jun. 11, 1985, Ser. No. 743,692

Claims priority, application Italy, Jun. 22, 1984, 66706 A/84

Int. Cl.⁴ B05D *3/06*

U.S. Cl. 427—40 **16 Claims**

1. A method of treatment of surfaces of objects made of plastic materials, resins, rubbers, papers, cardboards or metals comprising, treating said surfaces with an electrically excited flame of a burning gaseous mixture.

4,622,238

PROCESS FOR THE PRODUCTION OF BULKY, FIBROUS TEXTILE SHEET MATERIALS

Günter Franz, Friedberg/Derching; Bruno Reisch, Augsburg, and Michel Pässler, Neusäss, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Continuation of Ser. No. 583,123, Feb. 24, 1984, abandoned.
This application Nov. 13, 1985, Ser. No. 798,134
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306913
Int. Cl.[4] B05D *3/02, 5/00*
U.S. Cl. 427—45.1 17 Claims

1. A process for the production of bulky, fiber-containing textile sheet material from a material of loose fibers comprising:

filling the material of loose fibers with a binding agent comprising an aqueous dispersion of at least one polymer which is one of crosslinkable and vulcanizable and a foaming adjuvant;

puffing up the filled material only by subjecting the filled material to sufficient radiofrequency radiation in the range of from 30 kHz to 30 GHz to a multiple of its original volume; and

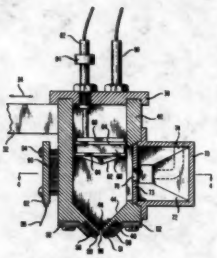
drying the puffed-up material for so bonding it and one of crosslinking and vulcanizing the polymer for so stabilizing it.

4,622,239

METHOD AND APPARATUS FOR DISPENSING VISCOUS MATERIALS

David Schoenthaler, Lower Makefield Township, Bucks County, Pa., and Thaddeus Wojcik, Hopewell Township, Mercer County, N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Feb. 18, 1986, Ser. No. 829,889
Int. Cl.[4] H05K *3/22*
U.S. Cl. 427—96 14 Claims



1. A method for dispensing viscous material through apertures in a substrate comprising the steps of:

directing a viscous material into a housing;

simultaneously compensating for fluctuations in the pressure of the material during the flow thereof into the housing;

applying pressure against the viscous material to force it from the housing through an opening therein;

confining the viscous material forced from the housing between a pair of flexible members extending from the housing on opposite sides of the opening so as to be in contact with the substrate; and

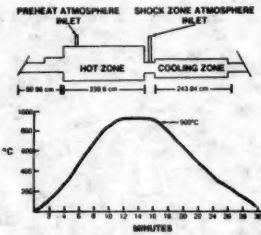
imparting a relative motion between the substrate and the housing so that the members urge the viscous material forced from the housing through the substrate apertures.

4,622,240

PROCESS FOR MANUFACTURING THICK-FILM ELECTRICAL COMPONENTS

Walter F. Yext, Allentown; Edward A. Hayduk, Wescosville, and Clark K. Fisher, Exton, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 12, 1985, Ser. No. 797,092
Int. Cl.[4] H05K *3/12*
U.S. Cl. 427—96 12 Claims



1. In a process of manufacturing thick-film electrical component by forming a paste suitable for application to a ceramic substrate, applying said paste to said substrate by a conventional screen printing technique, drying said printed substrate and firing said substrate and said paste at elevated temperatures to form said electrical component, the improvement comprising:

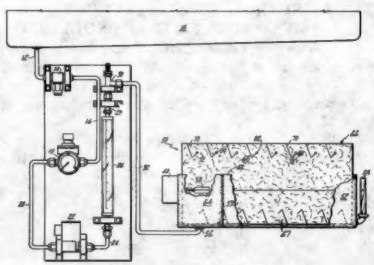
firing said paste and substrate composite in a furnace hot zone maintained at a temperature of between 300° and 1000° C. under an atmosphere of gaseous nitrogen to which is added from 10 to 10,000 ppm nitrous oxide.

4,622,241

METHOD AND APPARATUS FOR ACCURATELY DISPENSING A SOLUTION

Steven F. Keys, Churubusco, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 602,252, Apr. 20, 1984, abandoned.
This application Aug. 13, 1985, Ser. No. 765,733
Int. Cl.[4] B05C *1/06;* B05D *1/28*
U.S. Cl. 427—117 10 Claims



1. Apparatus for regulating the flow of solution being dispensed to a tank having a wicking applicator at least partially immersed in a reservoir of solution contained in the tank for coating a moving wire with the solution, the thickness of said solution on the wire being dependent on the distance between the level of the reservoir of solution in the tank and the location where the wire contacts the applicator, which comprises:

supply means for supplying solution;

a flow meter for accurately indicating the rate of solution flow through the meter;

a valve for adjusting the volume flow rate of solution and for discharging the solution to the reservoir;

conduit means serially connecting the supply means, the flow meter and the valve in a solution circuit such that the valve regulates the flow rate of solution and may be modulated based on the flow rate indicated by the flow meter; and

a solenoid valve positioned in the conduit means to prevent the flow of solution therethrough, said valve acting to allow solution to flow to the reservoir only when the moving wire is consuming solution from the reservoir through the wicking applicator such that the distance between the level of the reservoir and the location where the wire contacts the applicator is maintained whereby the solution is coated on the wire with a uniform thickness.

4,622,242

OPTICAL FIBRE MANUFACTURE

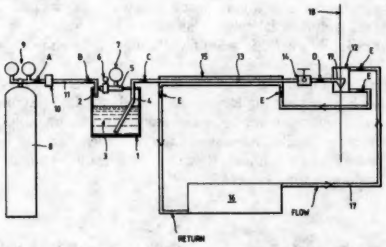
Malcolm D. Mackay, Harlow, England, assignor to Standard Telephones and Cables Public Limited Company, London, England

Filed May 23, 1985, Ser. No. 737,142

Claims priority, application United Kingdom, Jun. 21, 1984, 8415866

Int. Cl.[4] B05D 5/06

U.S. Cl. 427—163 **15 Claims**



1. A method of coating optical fibre including the step of passing the fibre through a die chamber containing coating material at a predetermined viscosity and pressure, the coating material being supplied to the die chamber from a tank pressurized by a steady pulse-free remote gas pressure source, the coating material temperature being controlled to a value consistent with the viscosity required in the die chamber by means of a temperature conditioning tube connected between the tank and the die chamber.

9. A variable-temperature pressure-coating system for use in coating an optical fibre comprising a pressure tank for containing coating material, means for pressurising the tank whereby coating material can be expelled therefrom and coupled to a die chamber following passage through a temperature conditioning tube, through which die chamber the optical fibre is passed in use of the system, and including means for controlling the tube to a temperature consistent with the coating material supplied to the die chamber being at a predetermined viscosity.

4,622,243

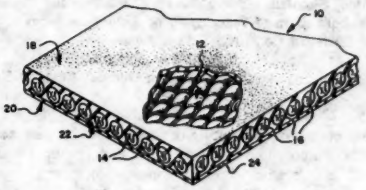
METHOD AND APPARATUS FOR PRODUCING ELASTOMER-COATED BIAS FABRIC

Delmar D. Long, Rock Hill, S.C., assignor to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 350,969, Feb. 22, 1982, Pat. No. 4,501,771, and a continuation-in-part of Ser. No. 533,098, Sep. 16, 1983, Pat. No. 4,490,428. This application Apr. 30, 1984, Ser. No. 605,509

Int. Cl.[4] B05D 3/12

U.S. Cl. 427—176 **16 Claims**



1. In a method for manufacturing elastomer-coated, bias fabric comprising:

a. pre-impregnating a bias fabric having opposed surfaces, yarns or fiber bundles, and interstices between said yarns or fiber bundles with a liquid composition which facilitates stretching and/or impregnation of said fabric,

b. transversely stretching said fabric while conducting said fabric along a predetermined path,

c. applying an elastomeric composition to both surfaces of said fabric while said fabric is conducted along said path in a transversely stretched condition, and

d. drying said coated elastomeric composition; the improvement comprising:

applying said elastomeric composition to both surfaces of said fabric by coating said elastomeric composition on one surface of said fabric and forcing said elastomeric composition through the interstices of said fabric to the opposite surface using a roll coater which extends across said predetermined path and is externally driven at a velocity different than the velocity with which said fabric is conducted across said roll such that thin uniform elastomeric coatings which penetrate the interstices of said fabric are formed on both surfaces of said fabric.

4,622,244

PROCESS FOR PREPARATION OF MICROCAPSULES

Galen G. Lapka, Belleville, Ill.; Norbert S. Mason, Clayton, and Curt Thies, Ballwin, both of Mo., assignors to The Washington University, St. Louis, Mo.

Division of Ser. No. 72,079, Sep. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 9,875, Feb. 7, 1979, abandoned, which is a continuation of Ser. No. 846,689, Oct. 31, 1977, abandoned, which is a continuation of Ser. No. 648,907, Jan. 14, 1976, abandoned, which is a division of Ser. No. 566,270, Apr. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 449,042, Mar. 7, 1974, abandoned. This application Aug. 23, 1984, Ser. No. 643,547

Int. Cl.[4] B01J 13/02

U.S. Cl. 427—213.32 **16 Claims**

1. In a process for the preparation of microcapsules having a particulate core material encapsulated by a polymeric coating wherein the polymer is first dissolved in a solvent in which the core material is not soluble, the polymer is precipitated by phase separation to encapsulate the core material by the addition of a phase separation agent to the polymer-core material-solvent system to form microcapsules of the core material having walls constituted by the polymer, and the microcapsules are thereafter isolated, the improvement which comprises

isolating said microcapsules at a temperature at least as low as −30° C.

12. The process according to claim 1 wherein said microcapsules are isolated by addition to said system of a nonsolvent for said polymer.

4,622,245

METHOD FOR PREVENTING POLYMER SCALE DEPOSITION IN THE POLYMERIZATION OF AN ETHYLENICALLY UNSATURATED MONOMER

Toshihide Shimizu, Chiba; Ichiro Kaneko, and Yoshiteru Shimakura, both of Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1984, Ser. No. 660,719
Claims priority, application Japan, Oct. 31, 1983, 58-204187
Int. Cl.⁴ C08F 0/2
U.S. Cl. 427—230 **3 Claims**

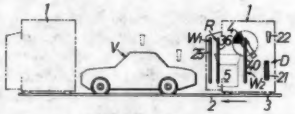
1. A method for preventing deposition of polymer scale on the walls of a polymerization reactor which comprises coating the wall surface with a coating composition comprising (a) a polymeric compound having at least one hydroxyl group in a molecule and (b) a silicic acid compound dissolved in a solvent and then drying the thus coated wall surface.

4,622,246

METHOD OF POLISHING A VEHICLE

Shigeo Takeuchi, Nagoya, Japan, assignor to Takeuchi Tekko Kabushiki Kaisha, Aichi, Japan

Filed Jan. 6, 1984, Ser. No. 568,687
Int. Cl.⁴ B05D 3/00, 3/12
U.S. Cl. 427—327 **4 Claims**



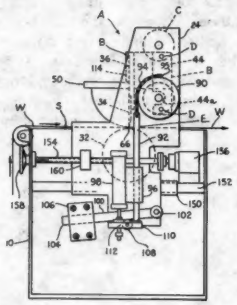
1. A method of polishing a vehicle, using a portal traveling frame which straddles a vehicle to be polished and moves reciprocatingly, comprising: a washing step wherein the surface of said vehicle body is brushing-washed by one set of rotative brushes provided on said portal traveling frame, upon the travel of said portal traveling frame in a first direction; a first polishing step wherein a foamy wax containing an anionic active agent is applied to said surface of said vehicle body by means of a first wax applicator provided on said portal traveling frame while said surface of said vehicle body is polished by said rotative brushes, upon the return travel of said portal travelling frame in a second direction opposite to said first direction; a second polishing and rinsing step wherein an aqueous wax containing a cationic active agent and hydrocarbonic wax is applied to said surface of said vehicle body by means of a second wax applicator provided on said portal traveling frame simultaneously with the polshing of said surface of said vehicle body with said rotative brushes, and subsequently a pure water is applied to said surface of said vehicle body by means of a rinsing device provided on said portal traveling frame, upon the travel of said portal traveling frame in said first direction, again, whereby an excessive wax on said surface of said vehicle body is washed off; and a drying step wherein a dried air is blown on said surface of said vehicle body by means of a drier provided on said portal traveling frame, upon the return travel of said portal traveling frame in said second direction, again, whereby said surface of said vehicle body is dried.

4,622,247

SEAM COMPENSATING COATING APPARATUS AND METHOD

Robert J. Poterala, Rte. 15, Rocky Pointe Way, Greenville, S.C. 29607

Filed Mar. 20, 1985, Ser. No. 714,160
Int. Cl.⁴ B05D 3/12; B05C 11/02, 3/02
U.S. Cl. 427—356 **27 Claims**



21. A method for accommodating passage of a thickened seam of a web passing through a coating machine underneath a coating knife blade comprising the steps of:

arranging said knife blade on said coating machine by means of a movable blade assembly;

passing said web between said knife blade and a support surface;

guiding said movable blade assembly positively in a backward arcuate lifting motion upon engagement with said seam causing a knife blade movement having a greater horizontal component in the direction of seam travel than a vertical component so that said knife blade and seam move generally together in a backwards horizontal direction upon initial impact and thereafter said blade rides gradually over said seam facilitating seam passage without seam damage; and

applying a blade biasing force to said knife blade against said web with a biasing force which gradually increases as said knife blade moves in said backward arcuate motion to maintain blade and seam contact for even coating of said seam and surrounding fabric area without application of excess coating material.

4,622,248

PRESERVATIVE COMPOSITION FOR WOOD

Robert M. Leach, Grand Island, and Richard J. Ziobro, Buffalo, both of N.Y., assignors to Osmose Wood Preserving Co. of America, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 596,637, Apr. 4, 1984, abandoned. This application May 22, 1985, Ser. No. 736,783
Int. Cl.⁴ C09D 5/16
U.S. Cl. 427—440 **34 Claims**

1. An aqueous, alkaline preservative composition for treating cellulose based products including wood to protect such products from insect attack in addition to fungal attack, said composition comprising:

(a) a preservative metal selected from the group consisting of copper, cobalt, cadmium, nickel and zinc and compounds and mixtures thereof in a preservative amount;

(b) an organic acid in a preservative amount selected from the group consisting of straight chain: aliphatic dicarboxylic acids containing 2–10 carbon atoms per molecule, aliphatic monocarboxylic hydroxy acids containing 2–6 carbon atoms per molecule, aliphatic dicarboxylic hydroxy acids containing 2–6 carbon atoms per molecule, aliphatic tricarboxylic hydroxy acids containing 2–6 car-

bon atoms per molecule, salts of said organic acids and mixtures of said organic acids, salts of said organic acids and said salts and said acids; and

(c) an ammonia containing compound capable of providing sufficient ammonia to solubilize said preservative metal, metal compounds or mixtures thereof and neutralize said organic acids, said composition having a molar ratio of organic acid to metal between about 0.1 to about 4.0 depending upon the preservative effect desired and the pH of said composition in the range of from about 9 to about 12.

17. A method for treating cellulose based products including wood to protect such products from insect attack in addition to fungal attack which comprises contacting said products with an aqueous, alkaline preservative solution comprising:

(a) a preservative metal selected from the group consisting of copper, cobalt, cadmium, nickel and zinc and compounds and mixtures thereof in a preservative amount;

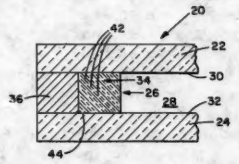
(b) an organic acid in a preservative amount selected from the group consisting of straight chain: aliphatic dicarboxylic acids containing 2–10 carbon atoms per molecule, aliphatic monocarboxylic hydroxy acids containing 2–6 carbon atoms per molecule, aliphatic dicarboxylic hydroxy acids containing 2–6 carbon atoms per molecule, aliphatic tricarboxylic hydroxy acids containing 2–6 carbon atoms per molecule, salts of said organic acids and mixtures of said organic acids, salts of said organic acids and said salts and said acids; and

(c) an ammonia containing compound capable of providing sufficient ammonia to solubilize said preservative metal, metal compounds or mixtures thereof and neutralize said organic acid, said composition having a molar ratio of organic acid to metal between about 0.1 to about 4.0 depending upon the preservative effect desired and the pH of said composition in the range of from about 9 to about 12.

4,622,249
MULTIPLE PANE UNIT HAVING A FLEXIBLE SPACING AND SEALING ASSEMBLY

George H. Bowser, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 15, 1985, Ser. No. 723,111
Int. Cl.[4] E06B *3/66*
U.S. Cl. 428—34 **20 Claims**



1. A multiple pane unit comprising a pair of glass sheets maintained in spaced-apart relationship to each other by a spacing and sealing assembly defining a substantially hermetically sealed, insulating air space between the sheets, wherein the spacing and sealing assembly comprises:

an outer element self-adhered to the marginal edge periphery of the inner, facing surfaces of the sheets, wherein said outer element is characterized by a water vapor permeability or transmission rate of no greater than about 8 gm./24 hours/1 sq. meter/mil at 100° F., 90 percent R.H., as determined by the ASTM E-96-66 Method E test;

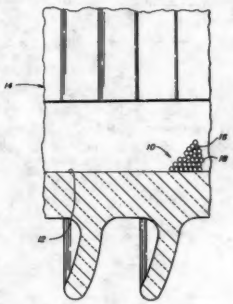
an inner element self-adhered to the marginal edge periphery of the inner, facing surface of the sheets inboard of said outer element, wherein said inner element is characterized by a water vapor permeability or transmission rate of at least about 10 gm./24 hours/1 sq. meter/mil at 100° F., 90 percent R.H., as determined by the ASTM E-96-66 Method E test, and wherein further, the adhesive bond between the interfacing surfaces of the sheets and said inner element is characterized by a shear strength of at least about 10 p.s i.; a tensile strength of at least about 20 p.s.i.; and, an elongation at break of at least about 10% as determined by The Adhesive Bond Strength Test.

dehydrating means for absorbing moisture present in the insulation air space.

4,622,250
INSULATING MATERIAL AND USE THEREOF IN INSULATORS

Leonard V. Chabala, Maywood; John Haarsma, Barrington; Raymond P. O'Leary, Evanston; Christopher D. Roman, Glenview, and Thomas J. Tobin, Northbrook, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Apr. 10, 1985, Ser. No. 721,615
Int. Cl.[4] H01H *31/00*
U.S. Cl. 428—35 **13 Claims**



1. An insulator comprising:

an elongaged insulator body having a longitudinal bore;

an operating member of insulating material disposed in said insulator body for movement therein; and

insulating material for filling a predetermined portion of the bore, said insulating material consisting of 10% to 80% by volume of an insulating fluid and 20% to 90% by volume of solid insulative bodies, the relative volumes and densities of said insulating fluid and said solid bodies, and the shape of said solid bodies being determined to provide a relatively free-flowing mixture, wherein said insulating fluid and said solid insulating bodies are of generally equal density.

4,622,251
NON-COMBUSTIBLE FILLER ROD FOR PROVIDING FIRE TIGHT JOINT PACKING

John F. Gibb, Littleton, Colo., assignor to Backer Rod Manufacturing & Supply Co., Denver, Colo.

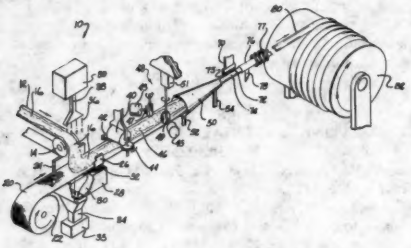
Filed Jan. 18, 1985, Ser. No. 692,502
Int. Cl.[4] F24F *7/00*
U.S. Cl. 428—36 **9 Claims**

1. A non-combustible construction assembly for closing a joint between spaced side surfaces of adjacent building panels made of a non-combustible material such as precast concrete or the like and comprising:

a continuous sheath of non-combustible porous flexible material having a length of approximately as long as the length of the joint and being filled throughout the length thereof with a filler material comprising short length randomly oriented unconnected separate fibers which are compacted by pressure applied by the spaced side surfaces of adjacent building panels to a density of at least 4 pounds per cubic foot and which are sufficiently resilient to exert

a retaining force on the side surfaces of at least 0.05 pounds per square inch;

the side surfaces of the adjacent construction panels and the



outer surface of said sheath forming a fire tight seal across the joint by mutual expansion of the adjacent building panels when subject to temperatures in excess of 400 degrees Fahrenheit.

4,622,252

LAMINATE WITH PLASTIC FILM

George W. Strobeck, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1982, Ser. No. 427,246

Int. Cl.[4] B32B *3/02, 11/10*

U.S. Cl. 428—88 **12 Claims**

1. A laminate comprising:

(a) a flexible sheet-like permeable or semipermeable support,

(b) a sheet-like bituminous mastic having an upper face and a reverse face,

(c) a plastic film, and

(d) a removable protective means;

wherein said support is in face-to-face contact with, and permanently adhered to, said upper face of said mastic; wherein said mastic extends beyond at least one end or edge of said support to create an extended mastic construction; wherein said plastic film is in face-to-face contact with, and permanently adhered to, the surface of said upper face of said mastic extending beyond said support; and wherein said removable means is adhered to and substantially covers the reverse face of said mastic.

4,622,253

THERMAL LAMINATED LINING AND METHOD OF MANUFACTURE

Harry Levy, 2119-04 Stewart Rd., Jamaica, N.Y. 11427

Filed Oct. 12, 1984, Ser. No. 660,448

Int. Cl.[4] D03D *27/00*

U.S. Cl. 428—91 **32 Claims**

1. A textured non-woven reflective insulating laminate fabric comprising:

a base layer of continuous pliable non-woven non-metallic material;

a continuous layer of heat reflective metal foil on one side of said pliable non-woven non-metallic sheet;

a layer of fiber wadding on the other side of said non-woven non-metallic sheet;

a nap of fibers extending from said layer of metal foil formed from fibers of said layer of wadding passing through said layer of continuous pliable non-woven non-metallic material and said layer of metal foil; and

said fibers of said nap being of sufficient weight to both act to carry moisture past said reflective sheet and layer of pliable continuous non-woven non-metallic material, and to maintain reflectivity of said reflective layer of metal foil.

4,622,254

FIBER MATERIAL FOR REINFORCING PLASTICS

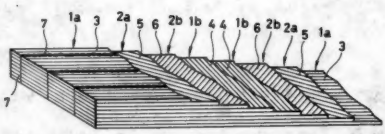
Akira Nishimura, Otsu; Kunio Maeda, Omihachiman, and Kazuo Kito, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 410,054, Aug. 20, 1982, abandoned. This application Aug. 14, 1985, Ser. No. 765,989

Claims priority, application Japan, Aug. 31, 1981, 56-136301; Nov. 19, 1981, 56-185649; Dec. 28, 1981, 56-213811; Apr. 1, 1982, 57-54247

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—102 **17 Claims**



1. A fiber material for reinforcing plastics, which comprises:

(1) a plurality of first woven fabrics comprised of multifilament yarns of carbon fibers having a twist number of at most 20 T/m and a cross-sectional area of 0.07 to 3.5 mm^2 which extend in two directions including the longitudinal direction and the transverse direction intersecting therewith at a substantially right angle,

(2) a plurality of second woven fabrics comprised of multifilament yarns of carbon fibers having a twist number of at most 20 T/m and a cross-sectional area of 0.07 to 3.5 mm^2 which extend in two directions including directions having angles of (25–65) degrees and −(25–65) degrees relative to the longitudinal direction, wherein said first and second woven fabrics, each in the form of a set consisting of one to several woven fabrics, are laminated alternately with each other in the same longitudinal direction, and

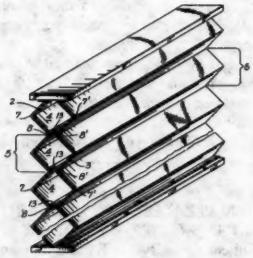
(3) continuous stitch yarns integrating all the above laminated first and second woven fabrics in a single chain stitching along the longitudinal direction of the fiber material, in a manner of repeatedly passing through the woven fabrics in the direction of lamination thereof with a passing length of 0.9 to 1.1 times the thickness of the fiber material for a reinforcing plastics, wherein said continuous stitch yarns are multifilament yarns composed of reinforcing fibers selected from the class consisting of glass fibers and polyaramide fibers having a cross-sectional area of 0.01 to 0.25 mm^2, an elongation at break greater than that of said carbon fibers in the woven fabrics and a thermal shrinkage at 120 degrees C. of not higher than 2%.

4,622,255

HONEYCOMB STRUCTURE FROM JOINED SINGLE PLEAT MATERIAL AND METHOD OF MAKING SAME

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Filed Nov. 7, 1985, Ser. No. 796,035
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 10 Claims



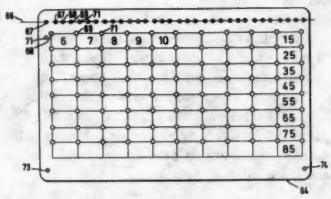
1. In a honeycomb structure constructed of foldable material and defining a plurality of longitudinally extending cells connected together in overlying expandable-collapsable relationship for collapsing each cell against the overlying cell, each cell having a longitudinally extending front face and a longitudinally extending back face, the improvement wherein:
(a) the front faces of all of the cells are defined by a first, single piece of foldable material;
(b) the back faces of all of the cells are defined by a second, single piece of foldable material; and
(c) the first and second materials are connected together between each adjacent overlying cell by separate strip material connected to the first and second materials between adjacent cells.

4,622,256

ACCOUNTING CARD

Heinz Brych, Caspar Olevianstrasse, 5500 Trier, Fed. Rep. of Germany

Filed Dec. 30, 1981, Ser. No. 335,858
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—131 5 Claims



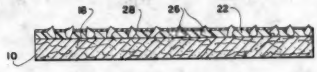
1. A small card to be punched for accounting purposes comprising:
a hand held card having longitudinal edges and transverse edges and having approximately the dimensions of a cheque card;
said hand held card consisting of a plastic material that may be creased;
a first plurality of holes in said hand held card comprising pairs of positioning holes at regular intervals in lines and columns parallel to said longitudinal edges and transverse edges;
each of said pairs of positioning holes locating a punching box; and
a second plurality of holes in said hand held card comprising clocking holes arranged in a line between said first plurality of holes and one of said longitudinal edges of said hand held card, parallel to said longitudinal edge;
wherein directly above said column of positioning holes the spacing between said clocking holes is larger than the spacing between other clocking holes.

4,622,257

NON-SKID FIBER/CEMENT TILE

Thomas L. Thompson, Balboa, Calif., assignor to THOM-Mcl, Balboa, Calif.

Filed Aug. 8, 1985, Ser. No. 763,528
Int. Cl.[4] B32B *5/16, 27/06, 27/14*
U.S. Cl. 428—143 16 Claims



1. A tile having a non-skid surface, comprising:
a base member formed from a fiber/cement mixture, said base member including an upper surface;
a bonding layer of material coated over said upper surface of said base member;
grit particles disseminated in said bonding layer wherein the size of said grit particles is greater than the thickness of said bonding layer such that a portion of said grit particles extend above the surface of said bonding layer; and
a, finish layer of material coated over said bonding layer, so as to firmly secure said grit particles within said bonding layer, said finish layer having a thickness which allows a portion of said grit particles to extend above said finish layer.

4,622,258

CONTACT LENS CLEANING ARTICLE

Arlene J. Mencke, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 484,163, Apr. 12, 1983, Pat. No. 4,533,394.
This application May 1, 1985, Ser. No. 729,288
Int. Cl.[4] B32B *5/14*
U.S. Cl. 428—171 25 Claims

1. An article comprising a thermoplastic, polymeric, nonwoven fibrous web having an average fiber diameter up to 50 microns and the web further comprises a surfactant physiologically acceptable to the eye, said article being a contact lens cleaner.

4,622,259

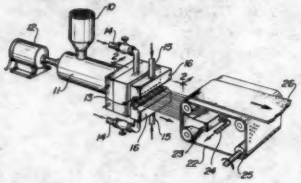
NONWOVEN MEDICAL FABRIC

Larry H. McAmish; Tralance O. Addy, both of Arlington, Tex., and George F. Lee, Greer, S.C., assignors to Surgikos, Inc., Arlington, Tex.

Filed Aug. 8, 1985, Ser. No. 763,508
Int. Cl.[4] B32B *5/14*
U.S. Cl. 428—171 11 Claims

1. A nonreinforced melt blown microfiber embossed fabric

having a minimum grab tensile strength to weight ratio greater than 0.8 N per gram per square meter, and having a minimum



Elmendorf tear strength to weight ratio greater than 0.04 N per gram per square meter.

4,622,260

MAT SHAPED COMPOSITE BODY

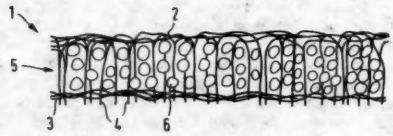
Guenter H. Tesch, 22, Rte de la Heitera, Fribourg, Switzerland (CH 1700)

Filed Jul. 26, 1982, Ser. No. 402,087

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1981, 3129509

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—173 **17 Claims**



1. A mat shaped composite body comprising an actively needle-bondable predensified cover layer of a fiber or filament fleece, a backing layer which is at least passively needle-bondable and comprises a tough sheet of synthetic plastic having depressions, and a discrete layer of particles comprising an inert material arranged between said layers, the particles have a hardness adequate to preserve them from destruction by needle bonding, and wherein the particles are held and secured against shifting in the direction of the plane of the cover layer by individual holding fibers or bundles of such holding fibers, and said holding fibers being inserted by needles in a distribution over the surface of the composite body through the particle layer and joining the cover layer and the backing layer with each other.

4,622,261

LASER RECORDING MATERIAL

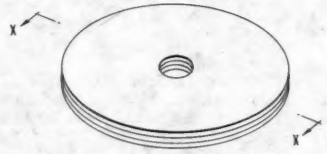
Takeji Ochiai, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1985, Ser. No. 723,980

Claims priority, application Japan, Apr. 16, 1984, 59-76162

Int. Cl.[4] B32B *3/10, 17/10, 27/06*

U.S. Cl. 428—195 **19 Claims**



1. A laser recording material comprising a base, a recording layer capable of recording and reproducing information using laser beams provided on said base and a polysiloxane coating film provided (1) on a side of the base opposite the recording layer, (2) between the recording layer and the base or (3) on the side of the base opposite the recording layer and also between the recording layer and the base, said coating film being produced from a monomer represented by the formula:

$$R_xSi(OR')_{4-x}$$

wherein R and R^1 each represents an alkyl group having from 1 to 3 carbon atoms or a phenyl group; and x represent 0 or an integer of from 1 to 3.

2. A laser recording material as claimed in claim 1, wherein the recording layer has a thickness of from 100 to 5500 Å and comprises at least one of a metal, a semimetal, a semiconductor, an alloy or combination of said metal, semimetal or semiconductor, and a compound of said metal or semimetal.

4,622,262

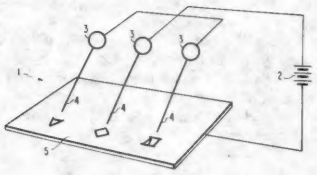
RECORDING MATERIALS OF IMPROVED LUBRICITY FOR USE IN ELECTROEROSION PRINTING

Mitchell S. Cohen, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 747,688, Jun. 24, 1985, abandoned, which is a continuation of Ser. No. 454,744, Dec. 30, 1982, abandoned. This application Feb. 14, 1986, Ser. No. 830,023

Int. Cl.[4] G01D *15/34*; B32B *7/00*

U.S. Cl. 428—219 **6 Claims**



1. An electroerosion recording medium suitable for electroerosion writing of a pattern therein by electrical pulses through a multi-stylus recording head, said pulses having a short duration and having a magnitude less than about 100 volts, including in combination

a support layer,

a thin conductive layer capable of being removed in selected areas thereof by said electroerosion writing when said styli contact said thin conductive layer, and

a lubricating overlayer on the stylus-contacting side of said thin conductive layer, said overlayer being less than 1000 angstroms in thickness and being comprised of solid laminar graphite particles dispersed in a binder wherein said graphite particles are dispersed noncontinuously in a lateral direction of said overlayer.

4,622,263

WATER ABSORBING WEBS

Katsutoshi Ando; Eiichi Nishiura, both of Otsu, and Yoshiyuki Yamamoto, Suzuka, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 14, 1985, Ser. No. 733,949

Claims priority, application Japan, May 15, 1984, 59-97366

Int. Cl.[4] D04H *1/58*

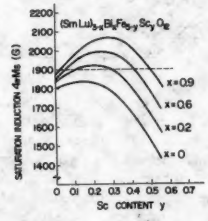
U.S. Cl. 428—288 **12 Claims**

1. A melt-blow water-absorbing web of fibers whose main component is a block-copolyetherester having a polyester segment and a polyether segment therein, with said polyether segment comprising 5 to 80 wt % of the total weight of said blockcopolyetherester.

4,622,264
GARNET FILM FOR MAGNETIC BUBBLE MEMORY ELEMENT

Yuzuru Hosoe, Hachioji; Norio Ohta, Sayama; Keikichi Andoo, Musashino, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1983, Ser. No. 543,423
Claims priority, application Japan, Oct. 20, 1982, 57-182851
Int. Cl.[4] B32B *00/00*
U.S. Cl. 428—332 **6 Claims**



1. A garnet film for magnetic bubble memory element, having uniaxial anitropy and a composition represented by the following general formula:

$$R_{3-x}Bi_xFe_{5-y}M_yO_{12}$$

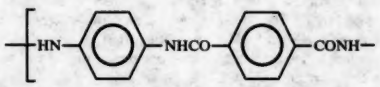
lanthanum, samarium, thulium, ytterbium, where R comprises both samarium and lutetium, with each of samarium and lutetium being included in the composition formula with at least 0.7 ions; M is at least one element selected from the group consisting of scandium, indium, and chromium; the values x and y lie within a region A enclosed by line segment a in FIG. **5** joining points **1** (0.2,0.3) and **2** (0.2,0.1), line semgment b joining points **2** (0.2,0.1) and **3** (0.9,0.03), line segment c joining points **3** (0.9,0.03) and **4** (0.9,0.4), and line segment d joining points **4** (0.9,0.4) and **1** (0.2,0.3); wherein said film exhibits a saturation induction $4\pi Ms$ of at least 1,900 G at room temperature and is capable of supporting magnetic bubbles with a bubble diameter of 0.4 micron or less; wherein said film exhibits a Curie temperature of at least 240° C.; and wherein said garnet film is formed on the surface of **(111)** oriented non-magnetic garnet substrate.

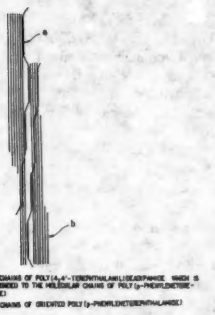
4,622,265
POLYMER ALLOY FIBER AND PROCESS THEREFOR

Han Sik Yoon; Tae Won Son; Chul Joo Lee, and Byung Ghyl Min, all of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Filed Feb. 11, 1985, Ser. No. 699,726
Claims priority, application Rep. of Korea, Jun. 29, 1984, 3721
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—364 **5 Claims**

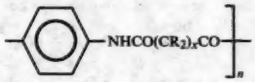
1. A polymer alloy fiber with ultrahigh tenacity and ultrahigh modulus which consists essentially of 50–95% by weight of poly(p-phenyleneterphthalamide) with an inherent viscosity of at least 5.0 and 50–5% by weight of a regularly ordered aromatic-aliphatic copolymer with an inherent viscosity of at least 2.0 having the formula:





a: MOLECULAR CHAINS OF POLY(4,4'-TEREPHTHALANILIDEBENZIMIDE WHICH IS STRONGLY BONDED TO THE MOLECULAR CHAINS OF POLY(p-PHENYLENETERPHTHALAMIDE)
b: MOLECULAR CHAINS OF ORIENTED POLY(p-PHENYLENETERPHTHALAMIDE)

-continued



wherein x is an integer of 4, 6, 8 or 10, and R is H or CH_3.

4,622,266
MOLDABLE ELECTRICALLY CONDUCTIVE POLYMER COMPOSITIONS

Oh-Kil Kim, Burke, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 30, 1985, Ser. No. 739,355
Int. Cl.[4] B32B *27/00*; H01B *1/00*
U.S. Cl. 428—394 **19 Claims**

1. A method for producing a moldable composition comprising the following steps:

a. selecting a moldable polymer from the group consisting of polycarbonate, poly(vinyl butyral), and poly(methyl methacrylate) with an ionization potential in the range of 8 eV to 12 eV;

b. selecting as a first liquid a mutual solvent selected from the group consisting of dimethylformamide, dimethylsulfoxide, N,N-dimethylacetamide, tetrahydrofuran, and methylene chloride in which the said polymer and a TCNQ salt species are together soluble;

c. dissolving in said mutual solvent at ambient temperature said moldable polymer together with an amount of said TCNQ salt species sufficient to coat and increase the conductivity of said moldable polymer;

d. obtaining a precipitate by mixing the polymer/TCNQ salt species/mutual solvent solution formed in step (c) into a chilled second liquid selected from the group consisting of acetonitrile and lower alkyl alcohols, miscible with the mutual solvent, in which the TCNQ salt species and the polymer are less soluble; and

e. isolating the TCNQ salt species-coated polymer moldable composite product formed in step (d).

13. A composite material containing a polymer selected from the group consisting of polycarbonate, poly(vinyl butyral), and poly(methyl methacrylate) and a TCNQ salt wherein:

the polymers are formed as filaments;

the TCNQ salt is in the form of micro-crystals adhering to each filament; and

the filament are in intimate contact with one another such that electrical current may be conducted from TCNQ salt microcrystals on one filament to TCNQ salt microcrystals on an adjacent filament.

4,622,267

MICROCAPSULES HAVING CAPSULE WALLS FORMED OF ALIPHATIC DIISOCYANATE AND DIAMINE

Kurt Riecke, Kempen, Fed. Rep. of Germany, assignor to Feldmuhle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 680,738

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346601

Int. Cl.[4] B01J *13/02;* B32B *27/40*

U.S. Cl. 428—402.21 4 Claims

1. In microcapsules of the type used for pressure-sensitive, carbonless copy papers, having walls formed from aliphatic diisocyanate and diamine and containing a solvent mixture with a die precursor dissolved therein, the solvent mixture containing a component which easily dissolves the dye precursor and the capsule wall material and a component which only poorly dissolves the dye precursor and the capsule wall, the improvement comprising

the poorly dissolving solvent component is an alkylbenzene having from 8 to 14 C-atoms in the alkyl moiety; and

the easily dissolving solvent component is a chloroparaffin,

the ratio of easily to poorly dissolving components ranging from 15:85 to 75:25 vol %, and being adjusted within this range so that a solution of the wall-forming aliphatic diisocyanate is just at the turbidity point in the mixture of easily dissolving and poorly dissolving components.

4,622,268

FIVE-COMPONENT COPOLYESTER, PROCESS FOR PREPARATION THEREOF, AND SHAPED ARTICLES THEREOF

Tadao Yatsu, Iwakuni; Takayuki Nakano, Ohtake; Nobuya Hinooka, and Tatsuo Kato, both of Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,189

Claims priority, application Japan, Nov. 28, 1983, 58-222182

Int. Cl.[4] B32B *27/08, 27/36*

U.S. Cl. 428—480 6 Claims

1. A laminated structure, in the stretched or non-stretched state, composed of a layer of a five-component copolyester composed of the following components (a) to (d) and having the following characteristics (e) and (f):

(a) 25 to 45 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of two aromatic dicarboxylic acid components composed of 70 to 90 mole % of an isophthalic acid component and 30 to 10 mole % of an aromatic dicarboxylic acid compound other than the isophthalic acid component, each based on the total moles of the two aromatic dicarboxylic acid components,

(b) 45 to 50 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of a diol component composed of 50 to 100 mole % of an ethylene glycol component and 0 to 50 mole % of a diol component other than the ethylene glycol component, each based on the total moles of the two diol components,

(c) 2 to 55 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of an aromatic monohydroxy-monocarboxylic acid component having 7 to 12 carbon atoms, and

(d) 0.01 to 2 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of a polyfunctional compound component having 3 to 15 carbon atoms and at least three functional groups selected from the class consisting of carboxyl and hydroxyl groups; and

(e) an intrinic viscosity [η], determined at 25° C. in a mixed solvent of phenol and tetrachloroethane in a weight ratio of 1:1, of 0.5 to 1.5 dl/g, and

(f) a glass transision temperature of 50° to 120° C. and a layer of poly(ethylene terephthalate) or a copolyester thereof having ethylene terephthalate as a main structural unit.

4,622,269

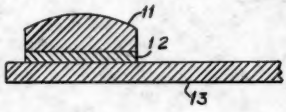
ELECTRICAL CONTACT AND PROCESS FOR MAKING THE SAME

Chi H. Leung, and Ron J. DeNuccio, both of Greensboro, N.C., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 30, 1985, Ser. No. 814,439

Int. Cl.[4] B22F *3/10*

U.S. Cl. 428—550 16 Claims



1. In the process for manufacturing contacts formed of an electrically conductive metal and containing a minor amount of graphite or cadmium oxide, said process comprising:

forming a mixture of finely divided electrically conductive metal and graphite or cadmium oxide; and

compressing said mixture into a body having a working surface and an obverse side, said working surface being adapted to contact another electrically conductive surface and said obverse side being adapted to be secured to an electrically conductive support; and

coating said obverse side of said body with a thin layer of said finely divided electrically conductive metal; and

sintering the coated contact at a temperature less then the melting point of said electrically conductive metal, whereby said electrically conductive metal is firmly secured to said working surface.

4,622,270

INORGANIC FIBER-REINFORCED METALLIC COMPOSITE MATERIAL

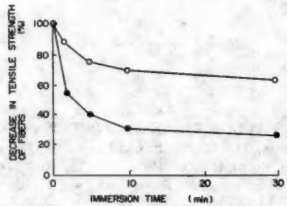
Takemi Yamamura; Masahiro Tokuse, and Teruhisa Furushima, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Nov. 1, 1985, Ser. No. 794,298

Claims priority, application Japan, Nov. 6, 1984, 59-232457

Int. Cl.[4] B32B *15/14*

U.S. Cl. 428—608 8 Claims



1. An inorganic fiber-reinforced metallic composite material comprising a matrix of a metal or its alloy and inorganic fibers as a reinforcing material, characterized in that

(a) the inorganic fibers are inorganic fibers containing silicon, either titanium or zirconium, nitrogen and oxygen and being composed of

(i) an amorphous material consisting substantially of Si, M, N and O, or

(ii) an aggregate consisting substantially of ultrafine crystalline particles with a particle diameter of not more than 500 Å of Si_2N_2O, Mn, Si_3N_4 and/or MN_{1-x}, and amorphous Si_2 and MO_2, provided that in the above formulae, M represents titanium or zirconium, and x is a number represented by $0<x<1$, or

(iii) a mixture of the amorphous material

(i) and the aggregate (ii), and

(b) said metal is selected from the group consisting of aluminum, magnesium, and titanium, or alloys thereof.

4,622,271
MAGNETIC RECORDING MEDIUM

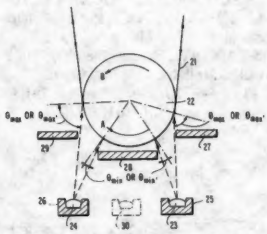
Yoshihiro Arai, and Ryuji Shirahata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1985, Ser. No. 725,198

Claims priority, application Japan, Apr. 20, 1984, 59-79833; Apr. 20, 1984, 59-79835

Int. Cl.⁴ H01F *10/02*

U.S. Cl. 428—615 **18 Claims**



1. A magnetic recording medium comprising a support having provided thereon a thin magnetic metal vapor deposition film, said film being provided by evaporating a magnetic metal material from an evaporation source to generate a vapor flow and directing the vapor flow to contact a moving support at an inclined angle, and having a curved and inclined column structure formed by continuously altering the incident angle of said vapor flow on the moving support from a high degree (θ_{max}) to a low degree (θ_{min}), and a non-magnetic metal vapor deposition film provided on the magnetic metal film, said non-magnetic metal film being provided by continuously altering the incident angle of vapor flow of the non-magnetic metal material to the moving support on which the magnetic metal film is formed between a high degree ($\theta_{max'}$) and a low degree ($\theta_{min'}$).

4,622,272
LUMINESCENT SCREEN FOR PICTURE DISPLAY APPARATUS AND METHOD FOR MANUFACTURING SUCH DEVICE

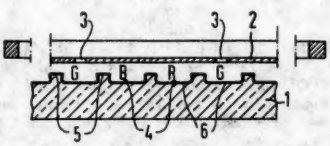
Rolf Wengert, and Pietro Cicchi, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 28, 1985, Ser. No. 738,487

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1984, 3428244

Int. Cl.⁴ H01J *31/12, 29/32*

U.S. Cl. 428—690 **3 Claims**



1. A luminescent screen for a picture display apparatus comprising, a screen glass plate formed with a plurality of depressions aligned in a raster shape on one planar surface, a luminophore layer applied to said glass plate in said depressions, a black-pigmented contrast border layer on said glass plate around said depressions, characterized in that the luminous colors of said luminophore layer (6) are preferably the luminous colors red (R), green (G) and blue (B) and are applied to said screen glass plate (1) in a raster or line-shaped arrangement by a silk-screening process.

4,622,273
RECORDING MEDIUM FOR PERPENDICULAR MAGNETIZATION

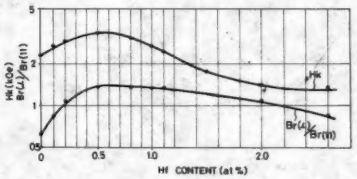
Keishi Nakashima; Takashi Hatanai, both of Nagaoka, and Koichi Mukasa, Koide, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Nov. 5, 1984, Ser. No. 668,300

Claims priority, application Japan, Nov. 5, 1983, 58-206909

Int. Cl.⁴ C22C *19/07;* G11B *5/66;* H01F *10/16*

U.S. Cl. 428—668 **2 Claims**



1. A magnetic recording medium for perpendicular magnetization, comprising:

(a) a base of a non-magnetic material;

(b) a first magnetic layer of a soft magnetic material on a surface of said base;

(c) a second magnetic layer having perpendicular anisotropy on a surface of said first magnetic layer said second magnetic layer being magnetized in a transverse direction thereof; and

(d) said second magnetic layer being composed of a three-element alloy of cobalt, chromium, and hafnium, cobalt being a main component with chromium a minor component and hafnium in the range of about 0.1 to 1.1 atomic % (equivalent to 0.3 to 3.3 wt. %) added thereto.

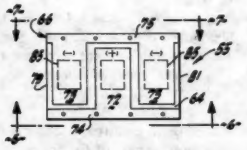
4,622,274
BATTERY TERMINAL

Eugene S. Lowrance, Oakland, Calif., assignor to Validec, Inc., San Carlos, Calif.

Filed Apr. 3, 1985, Ser. No. 719,322

Int. Cl.⁴ H01M *2/30, 2/34*

U.S. Cl. 429—1 **5 Claims**



1. A battery pack comprising: an array of at least one battery having two terminals and defining first and second, opposite faces; and a terminal set comprising:

a flat insulative body mounted to the first face of said battery array, and having two major opposite surfaces, one being an inner surface facing the battery array and the other being an outer surface;

a pair of conductors formed on the inner surface of the insulative body adjacent the battery array and being con-

nected, respectively, to the separate ones of the two battery terminals; and

three interdigitated terminals formed on the outer major surface of the insulative body, the body, the end terminals being connected in common to one of the inner surface conductors and the center terminal being connected to the second of the inner surface conductors.

4,622,275

FUEL CELL POWER PLANT

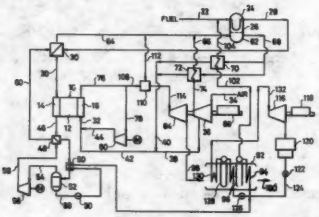
Yoshiki Noguchi; Tadao Arakawa; Nobuo Nagasaki; Shigehisa Sugita, all of Hitachi, and Masato Takeuchi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Jul. 31, 1985, Ser. No. 760,872

Claims priority, application Japan, Jul. 31, 1984, 59-160680

Int. Cl.[4] H01M *8/06*

U.S. Cl. 429—19 **6 Claims**



1. A fuel cell power plant having a fuel cell containing an electrolyte of molten carbonate, a fuel gas supplying apparatus adapted to supply the anode of said fuel cell with a reactive gas, a compressor to supply the cathode of said fuel cell with compressed air, a combustor to burn the exhaust gas from said anode and to supply the burned exhaust gas to the cathode, a turbine adapted to be supplied with the exhaust gas from said cathode through a cathode exhaust gas passage and adapted to drive said compressor and a generator, and a waste heat recovery apparatus adapted to supply the fluid after heat exchange with the exhaust gas from said turbine to said fuel gas supplying apparatus, characterized by comprising combustion means provided on said cathode exhaust gas passage and an anode exhaust gas supply passage to supply, as a fuel, the anode exhaust gas from said anode to said combustor, whereby the anode exhaust gas is burned with the cathode exhaust gas.

4,622,276

FUEL CELL ELECTROLYTE

Edward N. Walsh, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

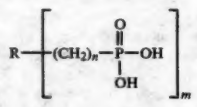
Continuation of Ser. No. 562,319, Dec. 16, 1983, Pat. No. 4,604,330. This application Jul. 2, 1985, Ser. No. 751,119

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

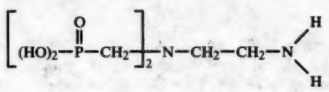
Int. Cl.[4] H01M *8/00*

U.S. Cl. 429—46 **19 Claims**

1. A fuel cell having an electrolyte composition comprising one or more phosphonic acids of the formula



wherein m represents an integer from 1 to 3, n represents O or the integer 1, and R is a moiety derived from hydroxyalkyl, alkyl, phenyl, alkylphenyl, vinyl, halophenyl, halomethylphenyl, amine, ammonia and



4,622,277

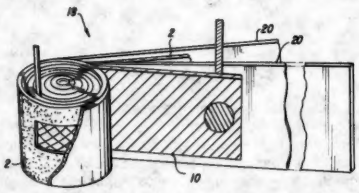
ELECTROCHEMICAL CELLS

Paul L. Bedder, Hickory, N.C.; Peter R. Moses, Windham, N.H.; Bhupendra Patel, Hickory, N.C.; Terrence F. Reise, Sudbury, and Alwyn H. Taylor, Wellesly Hills, both of Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Sep. 30, 1985, Ser. No. 781,836

Int. Cl.[4] H01M *4/00*

U.S. Cl. 429—94 **15 Claims**



1. An electrochemical cell having a positive terminal, a negative terminal, and at least two electrodes comprising:

an anode connected to the negative terminal;

a cathode connected to the positive terminal;

a separator interposed between said anode and cathode;

a nonaqueous electrolyte;

a first segment of exposed inert conductive metal coupled mechanically and electrically to the cathode; and

an inert metal dendrite target comprised of a second segment of exposed inert conductive metal coupled mechanically and electrically to the anode; wherein the position of said first segment of inert metal coupled to the cathode and the position of said second segment of inert metal coupled to the anode are such that said first segment and said second segment face each other and are held in physical separation by the separator, whereby during voltage reversal a dendrite will grow from said first segment toward said dendrite target and come in contact with said dendrite target.

4,622,278

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL COMPRISING CHARGE TRANSPORT COMPOUND AND STYRYL SENSITIZING DYE

Syunichi Kondo; Seiji Horie; Hideo Sato, and Kenji Sano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

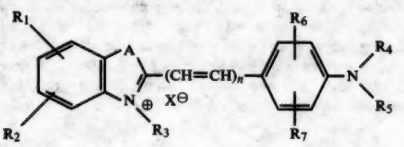
Filed Feb. 4, 1985, Ser. No. 697,981

Claims priority, application Japan, Feb. 3, 1984, 59-19095

Int. Cl.[4] G03G *5/06*

U.S. Cl. 430—59 **13 Claims**

1. An electrophotographic light-sensitive material comprising a charge transporting compound and a styryl dye represented by formula (I)



(I)

wherein

A represents N—R_8, O, S, Se, or

R_1 and R_2 each represents a hydrogen atom or a substituent having a Hammett's substituent constant, δ, of 0.2 or more;

R_3, R_6, R_7, R_8, R_9, and R_{10} each represents a hydrogen atom, an alkyl group or a substituted alkyl group containing from 1 to 5 carbon atoms in the alkyl moiety;

R_4 and R_5 each represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, or a substituted aryl group;

$X^{\ominus}$ represents an anion; and

n represents an integer of 1 or 2.

4,622,279

LIGHT TRANSMISSIBLE LIGHT-SENSITIVE RECORDING MATERIALS

Yasuaki Yuyama; Syunichi Kondo, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1985, Ser. No. 732,772

Claims priority, application Japan, May 11, 1984, 59-95270

Int. Cl.[4] G03C *1/76, 1/96;* G03G *5/10, 5/14*

U.S. Cl. 430—66 **8 Claims**

1. An electrophotographic recording material which comprises a long film having a width of 40 mm or less, and both sides of at least one surface of said film each have an image protective zone comprising about 50 to 99.5 parts by weight of a binder and about 0.5 to 50 parts by weight of a lubricant and having a kinetic friction coefficient of 0.35 or less which are provided in the lengthwise direction of the film in parallel with each other.

4,622,280

DISAZO COMPOUND, AND PHOTOCONDUCTIVE COMPOSITION AND ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINING THE SAME

Naonori Makino; Kouichi Kawamura; Seiji Horie, and Hideo Sato, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

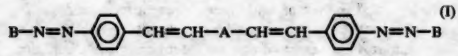
Continuation of Ser. No. 714,235, Mar. 21, 1985, which is a continuation of Ser. No. 459,061, Jan. 18, 1983, abandoned. This application Jul. 16, 1985, Ser. No. 755,504

Claims priority, application Japan, Jan. 18, 1982, 57-6605; May 4, 1982, 57-73437; Jun. 15, 1982, 57-101341

Int. Cl.[4] G03G *5/06*

U.S. Cl. 430—70 **10 Claims**

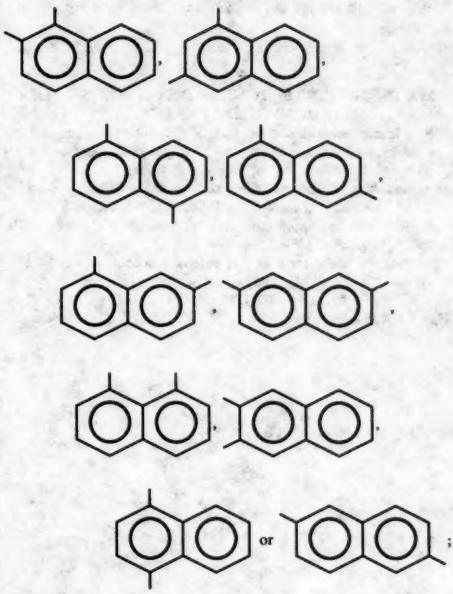
1. A photoconductive composition containing a disazo compound represented by the formula (I);



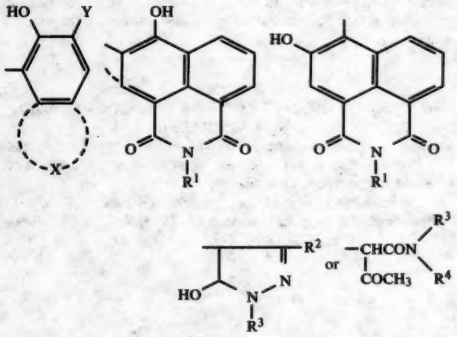
(I)

wherein A represents

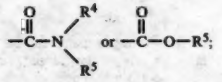
-continued



and B represents



wherein X is a moiety capable of forming a substituted aromatic ring, an unsubstituted aromatic ring, an unsubstituted heterocyclic aromatic ring or a substituted heterocyclic aromatic ring by combining with the benzene ring to which a hydroxyl and Y are attached; Y represents



R^1 is selected from the group consisting of alkyl, phenyl, substituted alkyl and substituted phenyl; R^2 is selected from the group consisting of hydrogen, lower alkyl, carbamoyl, carboxyl, alkoxy carbonyl, aryloxy carbonyl, substituted amino and unsubstituted amino; R^3 and R^5 each is selected from the group consisting of alkyl, substituted aromatic, unsubstituted aromatic, substituted aromatic heterocyclic, unsubstituted

aromatic heterocyclic, unsubstituted carbazoyl and substituted carbazoyl; and R^4 is selected from the group consisting of hydrogen, alkyl, phenyl, substituted alkyl and substituted phenyl.

4,622,281

MAGNETIC COLOR TONER CONTAINING GAMMA FERRIC OXIDE PARTICLES

Eiichi Imai, Narashino; Hiroyuki Kobayashi, and Yasuo Mitsuhashi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

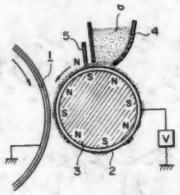
Continuation of Ser. No. 488,666, Apr. 26, 1983, abandoned. This application Jan. 3, 1986, Ser. No. 815,140

Claims priority, application Japan, Apr. 28, 1982, 57-72358; Apr. 28, 1982, 57-72359

The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.

Int. Cl.[4] C01G *49/06*; G03C *5/46*

U.S. Cl. 430—107 **11 Claims**



1. A magnetic color toner providing a hue from red, orange, or yellow to sepia, comprising gamma-Fe_2O_3 particles and a binder resin, wherein said toner is an insulating toner having enhanced triboelectric chargeability and enhanced transferrability.

4,622,282

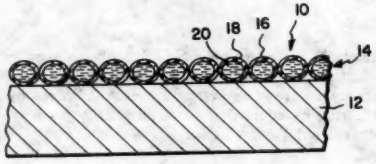
PHOTOGRAPHIC METHOD FOR FORMING IMAGES ON PLAIN PAPER

Donald L. Head; Richard F. Wright, both of Chillicothe, and Edward J. Saccocio, Columbus, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 703,255, Feb. 20, 1985, abandoned. This application Aug. 28, 1985, Ser. No. 770,539

Int. Cl.[4] G03C *1/72*; B05D *7/00*

U.S. Cl. 430—138 **21 Claims**



1. A process of forming images using an imaging sheet comprising a support having a chromogenic material and a layer of microcapsules containing a photosensitive composition on the surface thereof, which comprises the steps of:

image-wise exposing said imaging sheet to actinic radiation, subjecting said layer of microcapsules to a uniform rupturing force;

placing said imaging sheet in contact with a sheet of plain paper with said layer of microcapsules adjacent said sheet of plain paper, said steps of subjecting said layer of microcapsules to said rupturing force and placing said imaging sheet in contact with said sheet of plain paper being conducted in either order such that said chromogenic material is image-wise transferred to said sheet of plain paper, and

applying a developer material to the surface of said sheet of plain paper to which said chromogenic material is transferred, said developer material thereupon reacting with said chromogenic material and producing a visible image.

4,622,283

DEEP ULTRA-VIOLET LITHOGRAPHIC RESIST COMPOSITION AND PROCESS OF USING

Gary M. Gray, Pelham, Ala., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Continuation-in-part of Ser. No. 539,817, Oct. 7, 1983, abandoned. This application Sep. 12, 1985, Ser. No. 775,222

Int. Cl.[4] G03C *1/54, 1/60*; G03F *7/26*

U.S. Cl. 430—191 **16 Claims**

1. A lithographic resist composition for use with deep UV light of less than 300 nm wavelength, said composition comprising a base soluble film-forming polymer and in admixture therewith as a deep UV sensitizer a sufficient quantity of 2-diazo-5,5-dimethyl-1,3-cyclohexanedione solubilizing agent, whereby upon exposure to deep UV radiation the exposed composition becomes more soluble in alkaline developer.

7. A castable resist composition comprising the lithographic resist composition of claim **1** in a film-forming solvent having a boiling point of from about 120° to 210° C.

12. A process for forming a lithographic resist image comprising image-wise exposing to deep UV light of less than about 300 nm a film cast on a substrate and dissolving the exposed portion of said film with a basic solution, wherein the film cast on the substrate comprises a film cast from the castable composition of claim **7**.

4,622,284

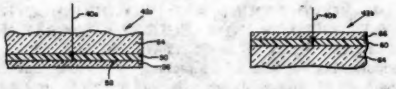
PROCESS OF USING METAL AZIDE RECORDING MEDIA WITH LASER

John L. West, and James T. Russell, both of Salt Lake City, Utah, assignors to Digital Recording Corporation, Wilton, Conn.

Filed Mar. 1, 1984, Ser. No. 585,175

Int. Cl.[4] G03C *5/16*; G01D *15/14, 15/34*

U.S. Cl. 430—290 **9 Claims**



1. The method of recording images on a recording medium which comprises contacting a beam of laser light with a medium containing (a) a substrate material, and (b) on the substrate material, a photosensitive material comprising an energy absorptive dye selected from the group consisting of erythrosin, erythrosin B, rhodamine 6G, sudan **111**, rose bengal, IR **125** and mixtures thereof, and a metal azide selected from the group consisting of cupric azide, lead azide, silver azide and mixtures thereof,

the dye and the metal azide being present in amounts sufficient that the beam causes the metal azide to exothermally react at the location of contact, form a void in the photosensitive material, thereby leaving a light area on a dark field, which area can be read by an optical readout device.

4,622,285

METHOD FOR MANUFACTURING POLYOXAZOLE AND POLYTHIAZOLE PRECURSORS

Hellmut Ahne, Röttenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 27, 1985, Ser. No. 716,767

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411659

Int. Cl.[4] C08G *65/40;* G03C *5/00*

U.S. Cl. 430—322 7 Claims

1. A method for the manufacture of an oligomeric and/or polymeric precursor of a polyoxazole or polythiazole, comprising reacting an aromatic and/or heterocyclic dihydroxy, dialkoxy or diaryloxydiamino compound or a corresponding dithio compound with a dicarboxylic acid in the presence of a carbodiimide.

4,622,286

PHOTOIMAGING COMPOSITION CONTAINING ADMIXTURE OF LEUCO DYE AND 2,4,5-TRIPHENYLIMIDAZOLYL DIMER

Thomas M. Sheets, Wyeox, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 16, 1985, Ser. No. 776,862

Int. Cl.[4] G03C *1/52*

U.S. Cl. 430—343 25 Claims

1. A photoimaging composition comprising an admixture of 2,4,5-triphenylimidazolyl dimers which are the product of 2-(o-chlorophenyl)-4,5-diphenylimidazole and 2,4-bis-(o-chlorophenyl)-5-[3,4-dimethoxyphenyl]-imidazole by oxidative coupling, a reaction product being 2,2',5-tris-(o-chlorophenyl)-4-(3,4-dimethoxyphenyl)-4',5'-diphenylbiimidazole, said admixture of dimers being present in an amount ranging from 0.01 to 90.0% by weight based on the weight of solids in the photoimaging composition, and a leuco dye that is oxidizable to dye by the imidazolyl radicals.

4,622,287

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Makoto Umemoto, and Kozo Aoki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

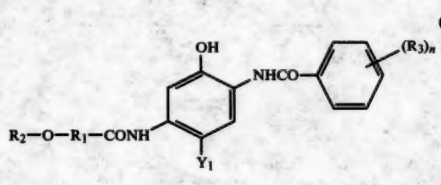
Filed Apr. 26, 1985, Ser. No. 727,719

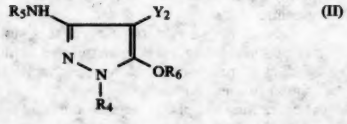
Claims priority, application Japan, Apr. 26, 1984, 59-84962

Int. Cl.[4] G03C *1/46, 1/84, 7/32*

U.S. Cl. 430—505 20 Claims

1. A silver halide color photographic light-sensitive material comprising a support and red-sensitive, green-sensitive and blue-sensitive light-sensitive layers formed on the support, said light-sensitive layers separately containing a coupler represented by the following formula (I), a coupler represented by the following formula (II) or (III), and a coupler represented by the following formula (IV):





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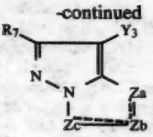
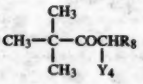




wherein

R_1 represents a substituted or unsubstituted divalent aliphatic group,

R_2 represents a phenyl group substituted by at least one cyano group, or a phenyl group substituted by at least one chlorine atom at the ortho-position,

R_3 represents a hydrogen atom, a halogen atom, or a substituted or unsubstituted alkyl or alkoxy group,

n represents an integer of 1 to 5, and when n is 2 or more, the R_3 substituents may be identical or different,

R_4 and R_5 each represents a substituted or unsubstituted phenyl group,

R_6 represents a hydrogen atom, an acyl group or an aliphatic or aromatic sulfonyl group,

R_7 represents a hydrogen atom or a substituent,

R_8 represents a substituted or unsubstituted N-phenylcarbamoyl group,

Z_a, Z_b and Z_c each represents methine, substituted methine, =N— or —NH—,

Y_1, Y_2, Y_3 nad Y_4 each represents a hydrogen atom or a group which can be split off during the coupling reaction with the oxidation product of a developing agent,

a dimer or a polymer may be formed by R_2, R_3 or Y_1; R_4, R_5 or Y_2; R_7, Y_3 or Z_a, Z_b or Z_c which is substituted methine; or R_8 or Y_4, and

the aliphatic group above is linear, branched or cyclic, and saturated or unsaturated.

4,622,288

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL HAVING IMPROVED ANTISTATICITY

Shigeki Yokoyama; Junichi Yamanouchi; Masakazu Yoneyama, and Yukio Maekawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

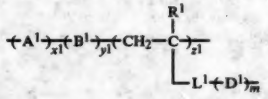
Filed Mar. 11, 1985, Ser. No. 710,257

Claims priority, application Japan, Mar. 9, 1984, 59-44973

Int. Cl.[4] G03C *1/82*

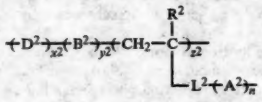
U.S. Cl. 430—527 12 Claims

1. A photographic light-sensitive material wherein at least one of the constituting layers contains a fluorine-containing graft polymer derived from a polymerizable hydrophobic fluorine-containing monomer containing at least one fluorine atom and a polymerizable hydrophilic monomer, wherein said fluorine-containing graft polymer comprises (1) a hydrophobic fluorine-containing polymer chain as a main component grafter to a hydrophilic polymer chain as a branch component through a divalent linking group, or (2) a hydrophilic polymer chain as a main component grafted to a hydrophobic fluorine-containing polymer chain as a branch component through a divalent linking group, wherein said fluorine-containing graft polymer is represented by formula (I) below:



wherein A^1 represents a polymer chain formed by polymeriz-

ing a polymerizable hydrophobic fluorine-containing monomer having at least one fluorine atom and at least one ethylenically unsaturated group; B^1 represents a polymer chain formed by polymerizing a polymerizable hydrophobic monomer having no fluorine atom and having at least one ethylenically unsaturated group; D^1 represents a polymer chain formed by polymerizing a polymerizable hydrophilic monomer having at least one ethylenically unsaturated group; L^1 represents a divalent linking group; R^1 represents a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms; m represents an average degree of polymerization of the hydrophilic monomer D^1 and ranges from 2 to about 1,000; and x^1, y^1 and z^1 represent percent ratios of copolymerization and range from 10 to 99.9 mol %, 0 to 50 mol %, and from 0.1 to 80 mol %, respectively or by formula (II) below:



(II)

wherein A^2 represents a polymer chain formed by polymerizing a polymerizable hydrophobic fluorine-containing monomer having at least one fluorine atom and at least one ethylenically unsaturated group; B^2 represents a polymer chain formed by polymerizing a polymerizable hydrophobic monomer having no fluorine atom and at least one ethylenically unsaturated group; D^2 represents a polymer chain formed by polymerizing a polymerizable hydrophilic monomer having at least one ethylenically unsaturated group; L^2 represents a divalent linking group; R^2 represents a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms; n represents an average degree of polymerization of a hydrophobic fluorine-containing monomer A^2 and ranges from 2 to about 1,000; and x^2, y^2 and z^2 represent percent ratios of copolymerization and range from 30 to 99.99 mol %, 0 to 50 mol %, and from 0.01 to 20 mol %, respectively.

4,622,289

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL WITH BASE PRECURSOR

Hiroyuki Hirai, and Kozo Sato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1984, Ser. No. 601,758
Claims priority, application Japan, Apr. 20, 1983, 58-69597
Int. Cl.[4] G03C 1/40, 5/54
U.S. Cl. 430—559 **21 Claims**

1. A heat-developable light-sensitive material comprising a support, a light-sensitive layer containing a light-sensitive silver halide, and at least one layer containing at least one salt selected from the group consisting of an alkali metal and alkaline earth metal salt of a carboxylic acid which decarboxylates at about 80° C. to about 250° C. as a base precursor, wherein said light sensitive material contains a dye releasing or dye forming material.

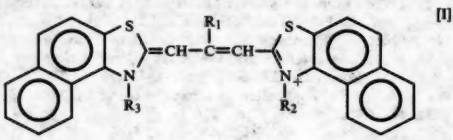
4,622,290

SILVER HALIDE PHOTOGRAPHIC EMULSION

Akira Tanaka, and Hidetoshi Miura, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

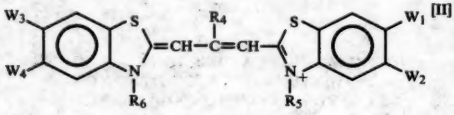
Filed Nov. 5, 1985, Ser. No. 795,254
Claims priority, application Japan, Nov. 9, 1984, 59-236040
Int. Cl.[4] G03C 1/19
U.S. Cl. 430—574 **6 Claims**

1. A silver halide photographic emulsion which contains a combination of at least one sensitizing dye represented by the general formula



[I]

wherein R_1 represents a hydrogen atom, an alkyl group, or an aralkyl group, R_2 represents a sulfoalkyl group or a sulfoaralkyl group, and R_3 represents an unsubstituted or substituted alkyl group, and at least one sensitizing dye represented by the general formula



[II]

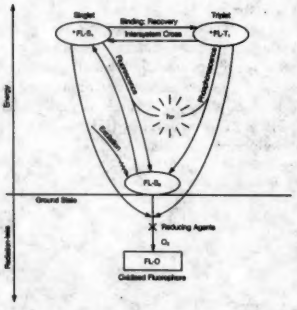
wherein W_1 to W_4 represent each an alkyl group, an alkoxy group, or a hydroxyl group, or a pair of W_1 and W_2 or a pair of W_3 and W_4 forms an alkylenedioxy group, provided that said pair of W_1 and W_2 and said pair of W_3 and W_4 have each at least one alkoxy or hydroxyl group or said alkylenedioxy group; R_4 represents a hydrogen atom, an alkyl group, an aralkyl group, or an aryl group; R_5 represents a sulfoalkyl group or a sulfoaralkyl group; and R_6 represents an unsubstituted for substituted alkyl group.

4,622,291

METHOD AND DEVICE FOR QUANTITATIVE END POINT DETERMINATION IN IMMUNOFLUORESCENCE USING MICROFLUOROPHOTOMETRY

Grace L. Picciolo, Fort Washington, Md., and David S. Kaplan, Fairfax, Va., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 11, 1984, Ser. No. 619,325
Int. Cl.[4] C12Q 1/00, 1/02; G01N 33/552, 33/542
U.S. Cl. 435—4 **12 Claims**



1. A method for quantitative determination of fluorescent endpoint of a fluorescent reaction in photometric microscopy comprising:

(a) incorporating a protective agent in a mounting medium for fluorescent reaction in an amount sufficient to reduce fading of fluorescent reaction product less than 25% of initial fluorescent intensity;

(b) calibrating the photometer used in said microscopy with a stable emitter; and

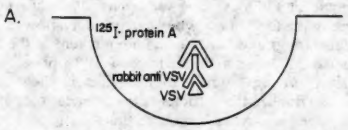
(c) recording the intensity of fluorescence of said fluorescent reaction product by means for measuring light intensity.

4,622,292

ASSAY AND KIT FOR DETERMINING INTERFERON

Michel Revel, and David Wallach, both of Rehovot, Israel, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed Aug. 22, 1983, Ser. No. 525,618
Claims priority, application Israel, Sep. 7, 1982, 66733
Int. Cl.[4] G01N *33/53, 33/545, 33/60*
U.S. Cl. 435—5 15 Claims



1. A process for the determination of interferon (IFN) which comprises cultivating cells by tissue culture, applying to such cell culture a sample of the IFN to be measured, infecting the cells with a virus, incubating same for a predetermined period of time, lysing the virus by application of a detergent, and assaying the lysed samples for virus protein content.

4,622,293

IODOTHYRONINE IMMUNOASSAYS EMPLOYING HMS AS TBP BLOCKING AGENT

Paul B. Ellis, and David L. Morris, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jul. 5, 1983, Ser. No. 510,814
Int. Cl.[4] G01N *33/53, 33/534, 33/535*
U.S. Cl. 435—7 40 Claims

1. In an immunoassay method for determining an iodothyronine in a biological fluid,

the improvement which comprises employing 2-hydroxy-4-methoxybenzophenone-5-sulfonic acid, or a salt thereof, as a blocking agent for the binding of said iodothyronine to thyroxine binding protein in said biological fluid.

4,622,294

LIPOSOME IMMUNOASSAY REAGENT AND METHOD

Viola T. Kung, 1055 Lemon St., Menlo Park, Calif. 94025, and Eleanor Canova-Davis, 2305 Bourbon Ct., South San Francisco, Calif. 94080

Filed Feb. 8, 1985, Ser. No. 699,860
Int. Cl.[4] G01N *33/53, 33/544;* C12Q *1/54*
U.S. Cl. 435—7 19 Claims

1. An assay reagent for determination of an analyte in a lipid-vesicle immunoassay, said reagent comprising:

a suspension of oligolamellar lipid vesicles containing encapsulated glucose-6-phosphate dehydrogenase at a specific activity of between about 1–10 units/μmole vesicle lipid, and glucose-6-phosphate, at a concentration of between about 2 and 50 mM, and

carried on each vesicle, a surface array of ligand molecules adapted to bind specifically and with high affinity to analyte-related anti-ligand molecules.

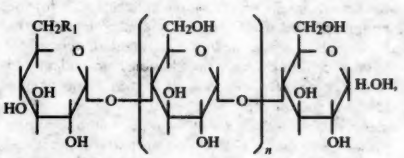
4,622,295

MODIFIED OLIGOSACCHARIDES USED AS SUBSTRATE FOR MEASURING α-AMYLASE ACTIVITY

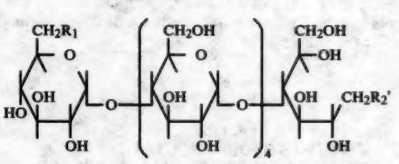
Tokuji Ikenaka, Sakai, and Kaoru Omichi, Toyonaka, both of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 14, 1983, Ser. No. 532,099
Claims priority, application Japan, Sep. 16, 1982, 57-161457; Jul. 28, 1983, 58-138344
Int. Cl.[4] C12Q *1/40, 1/54;* C12N *9/26;* C08B *37/00*
U.S. Cl. 435—22 12 Claims

1. A process for measuring α-amylase activity, using at least one oligosaccharide which has been modified in order to facilitate its use as a substrate for such measuring, said process comprising: (a) selecting a modified oligosaccharide from the group consisting of:



and



and mixtures thereof, wherein R_1 is a 2-aminopyridyl group, a 3-aminopyridyl, an anilino group, a methylanilino group, a hydroxyanilino group or a carboxylphenylamino group; and R_2 is a 2-aminopyridyl group, a 3-aminopyridyl group, an anilino group, a methylanilino group, a hydroxyanilino group, a carboxyphenylamino group, or a hydroxyl group, and n is an interger of 2 to 5;

for use as a substrate for measuring α-amylase activity; (b) contacting the modified oligosaccharide substrate with a sample to be tested for a sufficient time to allow for a reaction between the contents of the sample and the substrate; and (c) quantitively measuring a product which results from the reaction.

4,622,296

PROCESS FOR MEASURING ACTIVITY OF DEHYDROGENASE EMPLOYING A REACTION STOPPER

Kazuhiko Yamanishi, Tokyo, and Toshiro Hanada, Kawagoe, both of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 27, 1984, Ser. No. 686,817
Claims priority, application Japan, Dec. 28, 1983, 58-251883
Int. Cl.[4] C12Q *1/32*
U.S. Cl. 435—26 20 Claims

1. In a process for measuring the activity of a dehydrogenase comprising conducting an enzymatic reaction of a dehydrogenase in the presence of nicotinamide adenine dinucleotide as coenzyme and a tetrazolium salt as a color-producing reagent, stopping the reaction by adding a reaction stopper thereto, and measuring the activity of the dehydrogenase by colorimetic determination, the improvement wherein the reaction stopper is at least one member selected from the group consisting of decyl sulfate and salts thereof, dodecyl sulfate and salts thereof, and dodecylbenzenesulfonic acid and salts thereof.

4,622,297

PROCESS AND AGENT FOR TESTING THE SENSITIVITY OF BACTERIA

Manfred Kappner, Reinheim, and Harald Metz, Bickenbach, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 637,192

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1983, 3327839

Int. Cl.[4] C12Q *1/18, 1/34, 1/26, 1/20*

U.S. Cl. 435—32 23 Claims

1. A method for testing the sensitivity of a bacterium toward an antibiotic which acts primarily by distrupting murein biosynthesis in growing bacteria, comprising,

culturing the bacterium in a nutrient medium therefor which also contains an amount of the antibiotic equal to or greater than its minimum inhibitory concentration for the bacterium, and a substrate for a cytoplasmic enzyme of the bacterium, wherein said medium is substantially not effective to burst cells of the bacterium having a normal murein component, but is effective to burst bacterial cells having an abnormal murein component, and

determining the presence of a substantial amount of the cytoplasmic enzyme by observing a property of the resultant medium which is sensitive to the interaction of the enzyme with its substrate,

whereby the presence of a substantial amount of the cytoplasmic enzyme indicates the sensitivity of the bacterium toward the antibiotic.

4,622,298

DETECTION AND QUANTITATION OF MICROORGANISMS, LEUKOCYTES AND SQUAMOUS EPITHELIAL CELLS IN URINE

James D. Mansour, Raleigh; Thomas H. Schulte, Cary, and Burton H. Sage, Raleigh, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 9, 1984, Ser. No. 639,055

Int. Cl.[4] C12Q *1/04, 1/02;* G01N *21/64, 33/48*

U.S. Cl. 435—34 11 Claims

11. A method for the assessment of bacteriuria and pyuria by analysis of a urine sample for the presence of microorganisms, leukocytes and squamous epithelial cells comprising contacting a urine sample with a staining composition including ethidium bromide and a staining buffer to provide a mixture, incubating said mixture, and analyzing said mixture by a flow microfluorometry protocol including logarithmic scale measurement of forward and 90° light scattering and red and green fluorescence emission after a single setting of the flow microfluorometer.

4,622,299

PRODUCTION OF HIGH D.E. SYRUPS

Richard D. Harvey, and Paul R. Witt, both of Muscatine, Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

Filed Nov. 16, 1984, Ser. No. 672,294

Int. Cl.[4] C12P *19/20;* C12R *1/66, 1/845*

U.S. Cl. 435—96 4 Claims

1. A process for producing a dextrose-containing syrup which comprises liquefying a substrate containing at least about 30% by weight of starch (dry basis), treating at a temperature of from 150° F. to 175° F. the liquefied substrate with a fungal glucoamylase in sufficient amount to provide from 0.5 to 2.0 amyloglucosidase unit per gram of starch and to produce a syrup having a dextrose equivalent value of at least 90 in a period of not more than 3 hours.

4,622,300

HYDROLYSIS OF LACTOSE IN WHEY

Hans Ottofrickenstein, Darmstadt-Elberstadt; Hermann Plainer, Reinheim; Bruno Sprössler, and Helmut Uhlig, both of Rossdorf, all of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt-Elberstadt, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 589,686

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310430

Int. Cl.[4] C12P *19/02;* A23C *21/02;* C12N *11/00, 11/02*

U.S. Cl. 435—105 10 Claims

1. A process for the continuous hydrolysis of lactose by the treatment of whey having turbidity in excess of 10 NTU with immobilized lactase without prior heating and centrifuging, which comprises flowing whey through a reactor containing a fixed bed of immobilized lactase comprising lactase immobilized on particles of a granular solid material, and periodically interrupting the flow of the whey and passing a flow of cleansing liquid through the fixed bed countercurrent to the flow of whey under sufficient hydrostatic pressure to press the fixed bed against moving fragmentation devices in the reactor to separate and fluidize the particles of the granular solid material into a fluidized bed whereby the particles containing immobilized lactase are cleansed by removing material deposited thereon from whey.

4,622,301

2-OXOCARBOXYLIC ACID REDUCTASE AND ITS PREPARATION

Helmut Günther, Haag; Stefan Neumann, Eching, and Helmut Simon, Freising, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,043

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332562

Int. Cl.[4] C12P *7/42, 7/62;* C12N *9/02;* C12R *1/37*

U.S. Cl. 435—146 3 Claims

1. A 2-oxycarboxylic acid reductase which is independent of pyridine nucleotides, has a molecular weight of about 500,000, an isoelectric point of 4.9 and can be used within the pH range from 6 to 8, the optimum pH being 6.8 and which does not contain any flavine groups.

4,622,302

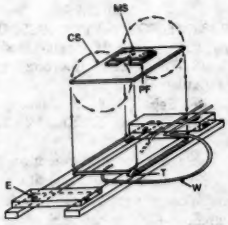
PROCESS FOR INDUCING MEMBRANE FUSION UNDER AN ELECTRIC FIELD

Arthur E. Sowers, Bethesda, Md., assignor to American National Red Cross, Washington, D.C.

Filed Aug. 9, 1984, Ser. No. 639,127

Int. Cl.[4] C12N *13/00, 5/00, 15/00*

U.S. Cl. 435—172.2 8 Claims



1. A process for inducing fusion of cell membranes comprising the sequential steps of (a) suspending cell membranes in an aqueous buffered medium so that the membranes are without contact with each other; (b) altering said membranes to a

fusogenic state by applying 2–30 pulses of direct current at a rate of 2 to 5 pulses per second in an electrical field strength of about 500–1000 volts/mm in the medium, said pulses having a rise time not exceeding about 10 microseconds and an exponential decay half time of about 0.2 milliseconds to about 1.2 milliseconds; and (c) thereafter bringing said fusogenic membranes in contact with each other.

4,622,303

DEFOAMERS FOR YEAST FERMENTATION

Karl Schmid, Mettmann; Joachim Schindler, Hilden, and Adolf Asbeck, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 695,763

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1984, 3434984

Int. Cl.⁴ C12N *1/00, 1/16;* **B01D** *17/00*

U.S. Cl. 435—243 **12 Claims**

1. A method for defoaming an aqueous yeast fermentation broth comprising adding to such broth an effective quantity of polyglycol ethers of linear, primary, saturated and unsaturated C_{16-18} alcohols containing an average of from 1 to 4 glycol ether groups which are ethylene glycol ether groups, propylene glycol ether groups, or a mixture of ethylene glycol ether and propylene glycol ether groups and wherein said polyglycol ethers contain from about 30 to about 80% by weight of oleyl alcohol component as the alcohol component.

4,622,304

METHOD OF GROWING CHEESE STARTER MICROORGANISMS

Malireddy S. Reddy, Aurora, Colo., assignor to Mid-America Dairymen, Inc., Springfield, Mo.

Continuation of Ser. No. 483,507, Apr. 11, 1983, abandoned. This application Jul. 19, 1985, Ser. No. 756,927

Int. Cl.⁴ C12N *1/20;* **A23C** *19/02, 21/02*

U.S. Cl. 435—253 **6 Claims**

1. A method of growing acid-producing cheese-making microorganisms, comprising the steps of:

providing a cheese-making microorganism starter medium in the form of a liquid and having a major proportion of whey therein, the whey present in said medium initially and throughout said method consisting essentially of sweet whey;

inoculating a mixture of coccus and rod microorganisms into said medium;

initially incubating said microorganisms in said medium until the pH of the latter drops to a level of from about 3.9 to 5.5, said initial incubation step being carried out without neutralization of the acid produced during the initial incubation; and

thereafter quickly raising the pH of said medium at least 1 pH unit, and further incubating said microorganisms in the medium with the final coccus to rod ratio of the microorganisms being from about 2:1 to 5:1.

4,622,305

METHOD OF THERMIONIC IONIZATION DETECTION OF CHEMICAL SUBSTANCES IN A GASEOUS ENVIRONMENT

Paul L. Patterson, 2212 Brampton Rd., Walnut Creek, Calif. 94598

Division of Ser. No. 471,282, Mar. 2, 1983, Pat. No. 4,524,047. This application Jun. 10, 1985, Ser. No. 732,649

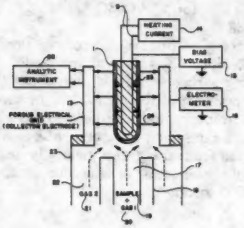
Int. Cl.⁴ G01N *27/62*

U.S. Cl. 436—103 **8 Claims**

1. A method of thermionic ionization detection of chemical substances in a gaseous environment, said method comprising the steps of:

electrically heating a thermionic source having a surface in a gaseous environment to operating temperatures in the range of from about 100° C. to about 1,000° C., said thermionic source comprising a metallic heater element, a first coating layer covering said heater element, said first coating layer comprising a hardened ceramic cement material which includes a non-alkali metal therein which is non-corrosive to said heater element at said operating temperatures, a second coating layer covering said first coating layer, said second coating layer comprising a hardened ceramic cement material impregnated with an alkali metal compound, the materials used in said heater element and said first and second coating layers all being capable of withstanding operating temperatures up to about 1,000° C.;

causing chemical substances to interact with the surface of



said thermionic source to form gas phase ions of said chemical substances by emission of electrical charge from said surface of said thermionic source;

maintaining a collector electrode in said gaseous environment adjacent said thermionic source;

maintaining a difference of electrical potential between said heater element and said collector electrode to cause said gas phase ions to move toward said collector electrode, and to cause a migration of electrical charge from said heater element through said first and second coating layers to replace the charge emitted from the surface of said thermionic source; and

measuring said gas phase ionization current to detect the presence of said chemical substances.

4,622,306

PROCESS FOR PROTECTING STEAM GENERATORS FROM MATERIAL DAMAGE

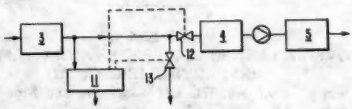
Hans Düve, Gladbeck, Fed. Rep. of Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 14, 1984, Ser. No. 640,583

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3330598

Int. Cl.⁴ G01N *21/00, 23/12, 35/08*

U.S. Cl. 436—150 **6 Claims**



1. A process for protecting steam generators from material damage caused by decomposition products of decomposable organic compounds present in the feedwater, which comprises:

removing a partial stream from a feedwater mainstream downstream of a demineralizing installation;

effecting continuous irradiation of the partial water stream with UV light in an irradiation chamber;

effeting continuous detection of decomposition products formed in the irradiated water;

transferring out only that amount of water from the water mainstream for which, in the irradiated partial stream, the quantity of decomposition products lies above a predetermined limit value;

discarding said transferred-out amount of the water mainstream or purifying same.

4,622,307

LOW SHRINKAGE KAOLIN REFRACTORY FIBER AND METHOD FOR MAKING SAME

William C. Miller, Littleton, and Leonard E. Olds, Castle Rock, both of Colo., assignors to Manville Corporation, Denver, Colo.

Filed May 29, 1985, Ser. No. 738,820
Int. Cl.[4] C03C *13/02*
U.S. Cl. 501—38 3 Claims

1. A refractory glass fiber of the composition in percent by weight 44–52% silica, 26–43% alumina, and 3–27% zirconia, said fiber having shrinkage of less than about 6% when subjected to a temperature of about 2400° F. for about four hours. Wherein said refractory fiber is produced from a two component composition consisting of in percent by weight: 59–96% of a clay selected from the group generally designated as 1:1 dioctahedral phyllosilicates of the composition $Al_2Si_2O_5.(OH)_4$ and 4–41% zircon.

4,622,308

CATALYST FOR THE PRODUCTION OF HYDROCARBONS FROM THE SYNTHESIS GAS

Minoru Koikeda; Takashi Suzuki, both of Yokohama; Koutaro Munemura, Zama; Yoshihiko Nishimoto, and Tetsuya Imai, both of Hiroshima, all of Japan, assignors to Research Association for Petroleum Alternatives Development, Tokyo, Japan

Continuation-in-part of Ser. No. 376,216, May 7, 1982, abandoned. This application Dec. 11, 1984, Ser. No. 680,244
Claims priority, application Japan, May 18, 1981, 56-73448; Sep. 25, 1981, 56-150597
Int. Cl.[4] B01J *29/10, 29/20*
U.S. Cl. 502—66 15 Claims

1. A catalyst for the production of hydrocarbons from the synthesis gas, which comprises the combination of an iron-containing Fischer-Tropsch catalyst, a zeolite and at least one metal selected from the group consisting of ruthenium, rhodium, platinum, palladium, iridium, cobalt and molybdenum, said metal being supported upon the iron-containing Fischer-Tropsch catalyst or supported upon a mixture of the iron-containing Fischer-Tropsch catalyst and the zeolite, wherein the iron in terms of iron oxide in the iron-containing Fischer-Tropsch catalyst is present in an amount of 5 to 80% by weight, based on the combined weight of the iron oxide and zeolite, and wherein the metal is present in amounts of 0.3 to 5% by weight, based upon the combined weight of the iron oxide and the zeolite.

4. The catalyst of claim 1, wherein the zeolite is selected from the group consisting of zeolites having a pore size of 5 to 9 Å and a silica to alumina mole ratio of at least 12.

4,622,309

NOVEL TITANIUM COMPLEXES AND CATALYSTS PREPARED THEREFROM

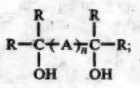
William M. Coleman, III, Lake Jackson, and Morris S. Edmondson, Alvin, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 565,436, Dec. 27, 1983, abandoned. This application Oct. 28, 1985, Ser. No. 791,662
The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.
Int. Cl.[4] C08F *4/02*
U.S. Cl. 502—115 23 Claims

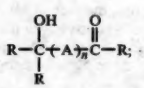
1. In a Ziegler-Natta catalyst containing a titanium component and a metal alkyl component said titanium component being supported on a magnesium halide support which is the product resulting from reacting in a hydrocarbon medium a compound represented by the formula $MgR_2''.xzMR''y$ wherein each R'' is independently a hydrocarbyl group having from 1 to about 20 carbon atoms, M is a metal selected from Al, Zn, Si, Sn, B and P, y has a number corresponding to the valence of M and x has a value from about 0.001 to about 10 with a reactive halide source wherein said reaction product which forms the support is not subsequently treated by copulverization with any other substance prior to being contacted with the titanium component; the improvement which comprises employing as the titanium component, that which results from reacting

(A) at least one titanium compound represented by the formula $Ti(OR)_xX_{4-x}$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms; X is a halogen and x has a value from zero to 4; with

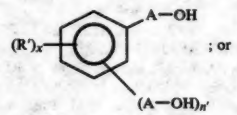
(B) at least one compound containing at least one aliphatic hydroxyl group represented by the formulas



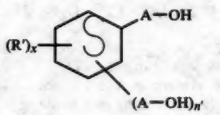
I.



II.



III.



IV.

wherein each A is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each R is independently hydrogen, a hydrocarbyl group or a halogen, nitro or hydrocarbyloxy substituted hydrocarbyl group, each such hydrocarbyl or hydrocarbyloxy groups having from 1 to about 20 carbon atoms; each R' is independently hydrogen, a halogen atom, a hydrocarbyl group, a hydrocarbyloxy group or a halogen, nitro or hydrocarbyloxy substituted hydrocarbyl group or a halogen, nitro or hydrocarbyloxy substituted hydrocarbyloxy group, each such hydrocarbyl or hydrocarbyloxy groups having from 1 to about 20 carbon atoms; each n is independently zero or 1; each n' has a value of from 1 to 5, and each x independently has a value of from zero to 4; and wherein components (A) and (B) are employed in quantities which provide a molar ratio of (B):(A) of 0.1:1 to about 10:1.

4,622,310

INORGANIC PHOSPHATE AEROGELS AND THEIR PREPARATION

Paul A. Iacobucci, Tarrytown, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 24, 1984, Ser. No. 685,357
Int. Cl.[4] B01J *27/14, 27/18;* C01B *15/16, 25/16*
U.S. Cl. 502—208 30 Claims

1. A method of preparing inorganic phosphate aerogels comprising: (a) reacting in a solvent medium, a compound comprising at least one metal with a source of phosphate ions

to produce a gel; (b) contacting the gel with a fluid above the critical temperature and pressure of the fluid until the solvent is extracted.

21. An inorganic phosphate aerogel powdered product, produced by the method of claim **1**.

4,622,311

METAL OXIDE HAVING UNIFORM PORE SIZES, THE PROCESS FOR PRODUCING SAID METAL OXIDE, AND CATALYST CARRIER COMPRISING THE SAID METAL OXIDE

Tadahiro Wakui, Hatu-Kimura 201, 3-4-9, Soka, Soka-shi, Saitama 340, and Tadahiko Handa, 2-10-80 Sakasegawa, Takarazuka, Hyogo 665, both of Japan

Filed Jul. 13, 1984, Ser. No. 630,562

Claims priority, application Japan, Jul. 15, 1983, 58-130118

Int. Cl.[4] B01J *21/12, 21/08, 21/04*

U.S. Cl. 502—235 **12 Claims**

7. A metal oxide produced by a process comprising the steps of:

(a) reacting (i) a salt selected from the group consisting of alkali metal salts and ammonium salts of aluminates and silicates with (ii) an organic compound represented by the formula

$$X_n\text{-}R\text{-}X'_n$$

wherein R is an alkyl, alkenyl, cycloalkyl, allyl, aromatic group, or heteroaromatic group having up to 30 carbon atoms,

X and X' are functional groups which are the same or different, and each is acid halide, sulfonyl halide, isocyanate, epoxy, ester, chloro, bromo or iodo,

and n is an integer from 1 to 3;

(b) extracting the resultant solid with an organic solvent selected from the group consisting of tetrahydrofuran, alcohols, dimethylformamide, dimethylacetoamide, dimethyl sulfoxide, ketones, acetonitrile, methylene chloride, chloroform and aromatic solvents; and

(c) removing the organic solvent from the solid or burning out the solvent by calcinating the solid;

whereby the metal oxide obtained has unifrom micropores with a pore size distribution concentrated substantially within the range of 10–100 Angstroms.

9. A metal oxide as in claim **7**, wherein the width of the pore size distribution is 1–30 Angstoms.

4,622,312

GROWTH HORMONE RELEASING FACTOR ANALOGS

Arthur M. Felix, West Caldwell; Edgar P. Heimer, Sparta, and Thomas F. Mowles, Pine Brook, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 24, 1984, Ser. No. 653,163

Int. Cl.[4] A61K *37/43;* **C07K** *7/10*

U.S. Cl. 514—12 **38 Claims**

1. A peptide of the formula

1 5 10
R—R_2—Asp—Ala—Ile—Phe—Thr—Asn—Ser—Tyr

15 20
Arg—R_3—Val—Leu—R_4—Gln—Leu—Ser—Ala—Arg

25
Lys—Leu—Leu—Gln—Asp—Ile—R_5—Ser—R_6—X

wherein R represents Tyr, desNH_2—Tyr, Ac—Tyr or His; R_2 represents Ala or D-Ala; R_3 represents Lys or Ala; R_4 represents Ala, Leu, Val, Ile, Nle or NVal; R_5 represents Leu, Nle or Ile; R_6 represents an amino acid sequence selected from Arg-Gln-Gln-Gly-Glu-Ser-Asn-Gln-Glu-Arg-Gly-Ala-Arg-Ala-Arg-Leu or fragments thereof where the fragment is reduced in number by one to fifteen amino acids from the carboxyl end; X is —OH or —NH_2; and, the pharmaceutically acceptable salts thereof.

4,622,313

O-SULFATE DERIVATIVES OF AVERMECTINS AND MILBEMYCINS HAVING IMPROVED WATER SOLUBILITY

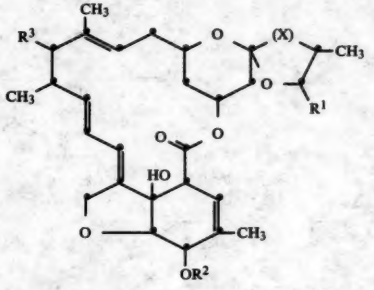
Matthew J. Wyvratt, Jr., Mountainside, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 1, 1985, Ser. No. 761,247

Int. Cl.[4] A61K *31/70, 31/365;* **C07H** *17/08;* **C07D** *493/22*

U.S. Cl. 514—30 **6 Claims**

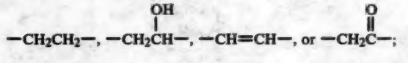
1. A compound having the formula:



III

wherein:

X is



R^1 is methyl, ethyl, isopropyl, or sec-butyl;

R^2 is hydrogen, methyl, or $-SO_3^{\ominus}M^{\oplus}$ wherein M is a member selected from the Group I elements Li, Na, K, Rb, Cs and Fr, the Group II Be, Mg, Ca, Sr, Ba and Ra elements or an ammonium, diloweralkyl ammonium, or pyridinium cation;

R^3 is hydrogen, hydroxy, $-OSO_3^{\ominus}M^{\oplus}$, α-L-oleandrosyloxy, 4'-(O)—$SO_3^{\ominus}M^{\oplus}$-(α-L-oleandrosyloxy), 4'-(α-L-oleandrosyl-α-L-oleandrosyloxy, 4''-(O)—$SO_3^{\ominus}M^{\oplus}$-4'-(α-L-oleandrosyl)-α-L-oleandrosyloxy, wherein M is as defined above; provided that one of said R^2 or R^3 groups contains said $-SO_3^{\ominus}M^{\oplus}$ or $-OSO_3^{\ominus}M^{\oplus}$ substituents; and, physiologically acceptable salts thereof.

3. A method for the treatment of parasitic infections which comprises administering to an animal infected with parasites an effective amount of a compound of claim **1**.

4,622,314

SUBSTITUTED OLIGOSACCHARIDE ANTIBIOTICS

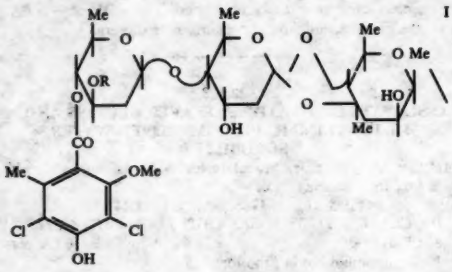
Ashit K. Ganguly, Upper Montclair; Olga Sarre, Verona, and Viyyoor M. Girijavallabhan, Parsippany, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Oct. 15, 1985, Ser. No. 787,405

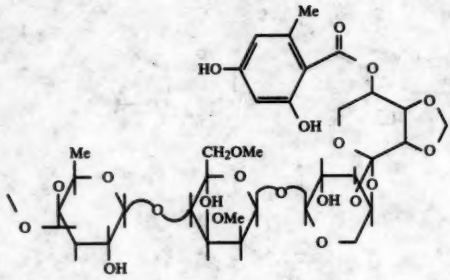
Int. Cl.[4] A61K *31/73;* **C07H** *5/04;* **C08B** *37/00*

U.S. Cl. 514—54 **15 Claims**

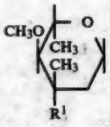
9. A method of eliciting an antibacterial effect in a warm-blooded animal having a susceptible gram-positive or gram-negative bacterial infection which comprises administering to said animal an antibacterially effective amount of a compound represented by the formula



I



wherein R is hydrogen, or



wherein R^1 is acetamido; ethylamino; or diethylamino; N hydroxylamino; nitroso or the pharmaceutically acceptable salts thereof.

4,622,315

ADDITIVES FOR IMPROVED PESTICIDE PHOTSTABILITY

Prem Dureja; John E. Casida, and Luis O. Ruzo, all of Berkeley, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 10, 1983, Ser. No. 465,440
Int. Cl.[4] A01N *65/00, 53/00*
U.S. Cl. 514—70 **6 Claims**

1. A composition having insecticidal activity and controllable persistence, comprising:

a photolabile pyrethroid having insecticidal activity; and

an effective amount of a toxicologically safe stabilizer which significantly decreases the rate of the photochemical decomposition reaction of the pyrethroid at a given light level, the stabilizer having an electron deficient π system, said stabilizer having a monocyclic aromatic ring with an attached nitro group and with an electron donating group ortho or para to the nitro group, said electron donating group being an amino or substituted amino group, a hydroxyl group, an alkoxy group or a phenoxy group.

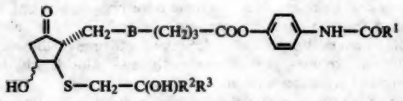
4,622,316

13-THIAPROSTAGLANDINS HAVING CYTOPROTECTIVE ACTIVITY

Bernd Simon, Dossenheim; Hanns-Gerd Dammann, Hamburg; Peter Müller, Heidelberg; Hans-Jürgen Legeler, Darmstadt-Eberstadt; Dieter Orth, Darmstadt, and Hans-Eckart Radüinz, Mühltal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 458,077, Jan. 14, 1983, abandoned. This application Nov. 8, 1984, Ser. No. 669,407
Claims priority, application Japan, Jul. 14, 1982, 57-121354
Int. Cl.[4] A61K *31/615, 31/215*
U.S. Cl. 514—162 **20 Claims**

1. A method of achieving a cytoprotective effect in a patient in need of such treatment, comprising administering to the patient an amount of a 13-thiaprostaglandin of the formula



wherein

B is $-CH_2-CH_2-$ or $-CH=CH-$,

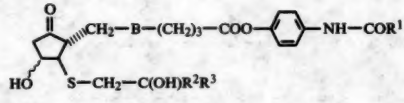
R^1 is phenyl, CH_3, or NH_2,

R^2 is H or CH_3, and

R^3 is pentyl, hexyl, 1-methylpentyl, or 1,1-dimethylpentyl

effective to achieve a cytoprotective effect but less than that required to achieve an antisecretory effect in said patient.

17. A pharmaceutical composition comprising (a) a medicament which is a cell tissue irritant and (b) an amount effective to achive a cytoprotective effect relative to that medicament of a 13-thiaprostaglandin of the formula



wherein

B is $-CH_2-CH_2-$ or $-CH=CH-$,

R^1 is phenyl, CH_3, or NH_2,

R^2 is H or CH_3, and

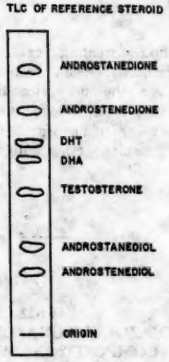
R^3 is pentyl, hexyl, 1-methylpentyl, or 1,1-dimethylpentyl,

4,622,317

TREATMENT OF SKIN OVER ANDROGENICITY USING COMPOSITIONS CONTAINING PREGNENOLONE

Sung L. Hsia; Walter Voigt; Marty Sawaya, and Kathryn Zeoli, all of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Division of Ser. No. 641,201, Aug. 16, 1984, Pat. No. 4,593,021.
This application Oct. 7, 1985, Ser. No. 784,900
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—178 5 Claims



1. A method of treating seborchea or hirsutism resulting from over androgenicity of the skin, comprising topically applying a therapeutically effective amount of pregnenolone to areas of the skin of a person in need of such treatment.

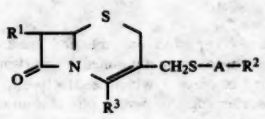
4,622,318

3-(SUBSTITUTED-ETHENYL OR ETHYNYL-THIOMETHYL) CEPHEMS

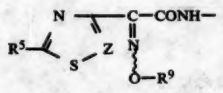
Takao Takaya, Kawanishi; Zenzaburo Tozuka, Toyonaka; Nobuyoshi Yasuda, Nishinomiya, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 19, 1984, Ser. No. 662,604
Claims priority, application United Kingdom, Oct. 31, 1983, 8329030
Int. Cl.[4] A61K *31/545*; C07D *501/18, 501/36*
U.S. Cl. 514—200 5 Claims

1. A cephem compound of the formula:



wherein R^1 is amino or a group of the formula:



in which

R^5 is amino or a protected amino group,

R^9 is lower alkyl, lower alkenyl, lower alkynyl, cyclo(lower-)alkenyl, carboxy(lower)alkyl, protected carboxy(lower-)alkyl, thietanyl, thiolanyl, thianyl, thiepanyl or thiocanyl, and

Z is N or CH,

R^2 is cyano, phenyl, pyridyl, lower alkylpyridyl or tri(-lower)alkylsilyl,

R^3 is carboxy or protected carboxy, and

A is —CH=CH— or —C≡C—,

and pharmaceutically acceptable salt thereof.

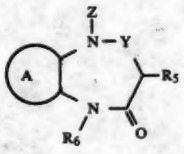
4,622,319

METHODS OF USING PAF-ANTAGONISTIC DIAZEPINES

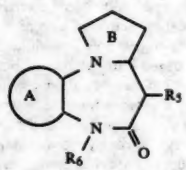
Jorge Casals-Stenzel, Mainz; Karl-Heinz Weber, Gau-Algesheim; Gerhard Walther, Bingen am Rhein; Albrecht Harreus, and Gojko Muacevic, both of Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,631
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1984, 3435972
Int. Cl.[4] A61K *31/55*
U.S. Cl. 514—220 13 Claims

1. A method of treating an individual having a disorder responsive to PAF-antagonist activity, which method comprises treating said individual with a therapeutically effective amount of a compound of formulae

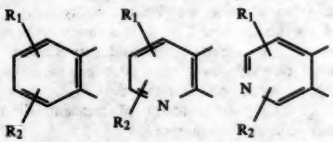

(I)

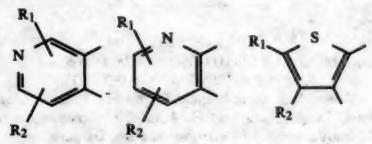
or

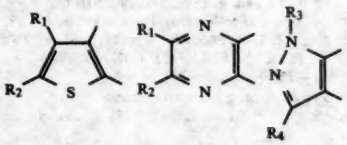

(II)

wherein

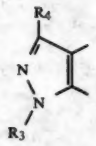
A is an anellated ring of formula



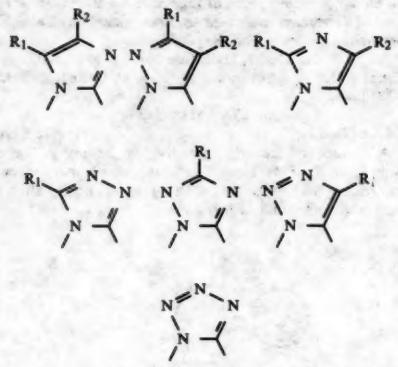




-continued



B is an anellated ring of formula



R_1 and R_2, are each independently hydrogen, a C_1–C_8 straight-chained or branched alkyl, alkenyl or alkynyl optionally mono- or polysubstituted by halogen, hydroxy, alkoxy, alkylmercapto, amino, alkylamino, dialkylamino, alkylcarbonyl, alkyloxycarbonyl or an acid amide group; cycloalkyl; a saturated carbocyclic or heterocyclic ring condensed on, which may contain oxygen, sulphur or nitrogen as a heteroatom while the nitrogen-containing ring can carry an alkyl group at the nitrogen atom; halogen, trifluoromethyl, nitro, cyano, optionally substituted amino, alkylmercapto, alkylcarbonyl, alkoxy, alkyloxycarbonyl or an acid amide group;

R_3, R_4 R_5 and Z are each independently hydrogen, a C_1–C_8 straight-chained or branched alkyl, alkenyl or alkynyl optionally mono- or polysubstituted by halogen, hydroxy, alkoxy, alkylmercapto, amino, alkylamino, dialkylamino, alkylcarbonyl, alkyloxycarbonyl, or an acid amide group;

R_6 is phenyl, which can optionally be substituted, preferably in the 2 position, by methyl, methoxy, halogen, nitro or trifluoromethyl, or R_6 can be thienyl or α-pyridyl;

Y is $<CO$, $<CS$ or $<CH_2$; and non-toxic, pharmaceutically acceptable acid addition salts thereof.

4,622,320

OXADIAZOLYLIMIDAZOBENZODIAZEPINE, COMPOSITIONS, AND METHOD

Frank Wätjen, Bagsvaerd; Mogens Engelstoft, Vaerlose; John B. Hansen, Lyngby, and Leif H. Jensen, Hellerup, all of Denmark, assignors to AS Ferrosan, Soborg, Denmark

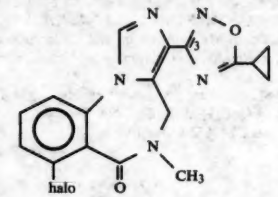
Filed Jan. 6, 1986, Ser. No. 816,732

Claims priority, application Denmark, May 17, 1985, 2204/85; Aug. 12, 1985, 3659/85; Oct. 17, 1985, 4769/85

Int. Cl.[4] A61K *31/55*; C07D *487/04*

U.S. Cl. 514—220 **6 Claims**

1. A 3-(5-cyclopropyl-1,2,4-oxadiazol-3-yl)-5,6-dihydro-5-methyl-6-oxo-7-halo-4H-imidazo[1,5-a][1,4]benzodiazepine having the formula



6. A method of treating a central nervous system ailment in a subject in need of such treatment comprising the step of administering to the said subject an amount of a compound of claim **1**, **2**, or **3** which is effective for the alleviation of such ailment in the form of a pharmaceutical composition thereof, in which it is present together with a pharmaceutically-acceptable carrier or diluent.

4,622,321

OXADIAZOLYLIMIDAZOBENZODIAZEPINE, COMPOSITIONS, AND METHOD

Frank Wätjen, Bagsvaerd; Mogens Engelstoft, Vaerlose; John B. Hansen, Lyngby, and Leif H. Jensen, Hellerup, all of Denmark, assignors to AS Ferrosan, Søborg, Denmark

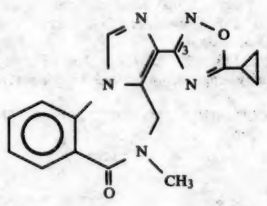
Filed Jan. 6, 1986, Ser. No. 816,731

Claims priority, application Denmark, May 17, 1985, 2204/85; Aug. 12, 1985, 3659/85; Oct. 17, 1985, 4769/85

Int. Cl.[4] A61K *31/55*; C07D *487/04*

U.S. Cl. 514—220 **4 Claims**

1. The compound 3-(5-cyclopropyl-1,2,4-oxadiazol-3-yl)-5,6-dihydro-5-methyl-6-oxo-4H-imidazo[1,5-a][1,4]benzodiazepine having the formula



2. A pharmaceutical composition suitable for use in the treatment of a central nervous system ailment comprising an amount of a compound of claim **1** which is effective for the alleviation of such disorder together with a pharmaceutically-acceptable carrier or diluent.

4,622,322

AROYL SUBSTITUTED DIHYDRO-1,4-THIAZINES

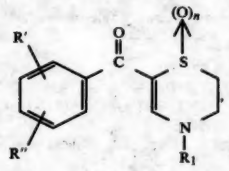
Harris B. Renfroe, West Nyack, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 29, 1984, Ser. No. 625,946

Int. Cl.[4] C07D *279/10*; A61K *31/54*

U.S. Cl. 514—222 **7 Claims**

1. A compound of the formula



(Ib)

wherein R_1 represents hydrogen, C_1–C_4-alkanoyl, or C_1–C_4-alkyl; n is zero, one, or two; R′ is hydrogen, trifluoromethyl or halogen; and R″ is halogen.

5. A method for treating rheumatic disorders, which comprises administering to a host in need of such administration an effective disease-modifying antirheumatic amount of a compound of the formula Ib according to claim 1.

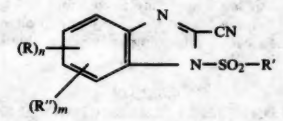
4,622,323

FUNGICIDAL 2-CYANOBENZIMIDAZOLE DERIVATIVES

Raymond Girsudon, Lesigny, and Georges Santini, Lyons, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed Feb. 6, 1985, Ser. No. 698,846
Claims priority, application France, Feb. 6, 1984, 84 02118
Int. Cl.[4] A01N *43/52, 43/84;* C07D *413/12, 235/24*
U.S. Cl. 514—228 7 Claims

1. A 2-cyanobenzimidazole derivative of the formula:



in which:

n denotes an integer equal to 0, 1 or 2,

m denotes an integer equal to 1 or 2,

R denotes a halogen atom or a lower alkyl radical optionally substituted with one or more halogen atoms; a lower alkoxy radical optionally substituted with one or more halogen atoms; a lower alkylthio radical optionally substituted with one or more halogen atoms; nitro; cyano, it being understood that, when n equals 2, the subsituents R can be either identical or different;

R′ denotes a lower alkyl or lower cycloalkyl radical optionally substituted with one or more halogen atoms; or an amino radical optionally substituted with one or two lower alkyl radicals, which may be identical or different, and are themselves optionally substituted by one or more halogen atoms; or a nitrogen atom substituted with two radicals forming with this nitrogen atom a morpholino or pyrrolidino group;

R″ denotes an optionally substituted phenoxy radical or an optionally substituted phenylthio radical the substituents in each instance being halogen, lower alkyl, cyano, nitro, lower alkoxy or lower haloalkyl.

7. A process for treating plants against phytopathogenic fungi, which consists in applying to these plants an effective quantity of a compound according to one of claims 1 to 3.

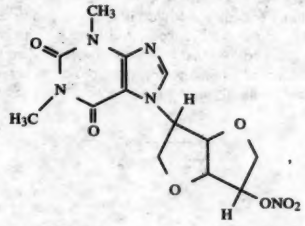
4,622,324

1.4;3.6-DIANHYDROHEXITOL NITRATES SUBSTITUTED BY PURINE BASES, AND PHARMACEUTICAL COMPOSITIONS

Klaus Klessing, Ettlingen, and Shyam S. Chatterjee, Karlsruhe, both of Fed. Rep. of Germany, assignors to Dr. Willmar Schwabe GmbH & Co., Karlsruhe, Fed. Rep. of Germany

Division of Ser. No. 285,406, Jul. 20, 1981, Pat. No. 4,479,951.
This application Aug. 17, 1984, Ser. No. 642,140
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028273
Int. Cl.[4] C07D *473/34;* A61K *31/535*
U.S. Cl. 514—265 6 Claims

1. Theophyllinyldesoxy-1.4;3.6-dianhydrohexitol nitrates of the formula Ib



(Ib)

as well as their physiologically acceptable acid-addition salts.

4,622,325

ANTI-CANCER COMPOSITION FOR DELIVERING 5-FLUOROURACIL

Setsuro Fujii, Toyonaka; Norio Unemi, and Setsuo Takeda, both of Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company Limited, Tokyo, Japan

Division of Ser. No. 214,022, Dec. 8, 1980, Pat. No. 4,507,301, which is a continuation-in-part of Ser. No. 15,161, Feb. 26, 1979, Pat. No. 4,328,229, which is a continuation-in-part of Ser. No. 891,343, Mar. 29, 1977, abandoned. This application Mar. 20, 1984, Ser. No. 591,459
Claims priority, application Japan, Apr. 5, 1977, 52-39341; Feb. 10, 1978, 53-14676
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/505*
U.S. Cl. 514—274 9 Claims

9. A method of delivering 5-fluorouracil to a cancer sensitive to 5-fluorouracil in a warm blooded animal, the method comprising administering to said animal in separate doses uracil or a pharmaceutically acceptable salt thereof and 1-n-hexylcarbamoyl-5-fluorouracil wherein about 0.01 to less than 0.1 mole of 1-n-hexylcarbamoyl-5-fluorouracil is used per mole of the uracil or salt thereof, in an amount which is effective to deliver an anti-cancer amount of 5-fluorouracil to the cancer and the pharmaceutically acceptable salts thereof.

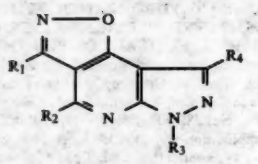
4,622,326

6H-ISOXAZOLO(5,4-D)PYRAZOLO(3,4-B)PYRIDINES, AND THEIR USE AS ANTIHYPERTENSIVE AND ANALGESIC AGENTS

Gregory M. Shutske, Somerset, N.J., assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Dec. 23, 1985, Ser. No. 812,590
Int. Cl.[4] A61K *31/415;* C07D *498/14*
U.S. Cl. 514—293 28 Claims

1. A compound having the formula



where R_1 is hydrogen, loweralkyl, arylloweralkyl, aryl or heteroaryl; R_2 is hydrogen or loweralkyl; R_3 is loweralkyl, loweralkoxyloweralkyl, cycloalkyl, arylloweralkyl or heteroarylmethyl; and R_4 is hydrogen or loweralkyl, the term aryl in each occurrence signifying an unsubstituted phenyl group or a phenyl group substituted with 1, 2 or 3 substituents each of which being independently a loweralkyl group, loweralkoxy group, hydroxy group, trifluoromethyl group, chlorine or fluorine, with the proviso that the aryl group shall not have chlorine or fluorine at the ortho position; the term heteroaryl in each occurrence signifying a group having the formula

where Y is O, S, NR_6 or CH=N, R_6 being hydrogen, loweralkyl or phenylloweralkyl; and the term cycloalkyl signifying a cycloalkyl group of 3 to 7 carbon atoms.

26. An antihypertensive composition comprising an effective blood pressure lowering amount of the compound as defined in claim 1 and a carrier therefor.

4,622,327

2H-AZETO[2,1-a]-ISOQUINOLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Gábor Bernáth; Jeno Kóbor, both of Szeged; Alajos Kálmán; Pál Sohár, both of Budapest; Ferenc Fülöp, Szeged; Elemér Ezer, Budapest; György Hajós, Budapest; Éva Pálosi, Budapest; László Dénes, Budapest, and László Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

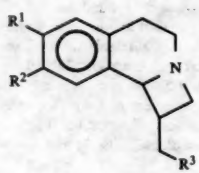
Filed Oct. 25, 1984, Ser. No. 664,786

Claims priority, application Hungary, Oct. 25, 1983, 3655-83

Int. Cl.[4] A61K *31/40;* **C07D** *455/08*

U.S. Cl. 514—294 **8 Claims**

1. A compound of formula (I)



(I)

wherein

R^1 and R^2 represent hydroxyl or alkoxy having from 1 to 6 carbon atoms,

R^3 is hydroxyl, halogen or an

group,

in which

R^4 is optionally substituted phenyl,

X is oxygen or sulfur,

and acid addition, metal and quaternary salts thereof.

4,622,328

PHENYL-NAPHTHYRIDINES AND DRUGS CONTAINING THEM, PARTICULARLY ANTI-ULCER DRUGS

Jean-Marie Teulon, La Celle Saint Cloud, France, assignor to Carpibem, France

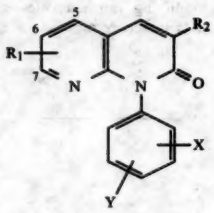
Filed Jul. 2, 1985, Ser. No. 751,610

Claims priority, application France, Jul. 11, 1984, 84 11040

Int. Cl.[4] A61K *31/44;* **C07D** *47/04*

U.S. Cl. 514—300 **6 Claims**

1. A compound of the formula:



in which:

R_1 represents hydrogen, a lower alkyl or cycloalkyl radical and may be in 5, 6 or 7 position of the naphthyridine;

R_2 represents hydrogen, a straight or branched lower alkyl radical;

X and/or Y represent hydrogen, a lower alkyl radical of 1 to 5 carbon atoms, a halogen, a trifluoromethyl, methoxy, nitro, thiomethyl group and may be in ortho, meta or para position on the aromatic ring.

6. A pharmaceutical composition in dosage unit form useful for the treatment of gastrointestinal ulcers, inflammatory conditions and analgesia comprising from about 200 to 600 milligrams of at least one compound of any one of claims 1 to 4 or 5 in association with a physiologically acceptable excipient.

4,622,329

1-CYCLOHEXYL-3,4-DIHYDROISOQUINOLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Gábor Bernáth; Jenó Kóbor; János Lázár; Gábor Motika, all of Szeged; Elemer Ezer, Budapest; György Hajós, Budapest; Éva Pálosi, Budapest; László Dénes, Budapest, and László Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyart R.T., Budapest, Hungary

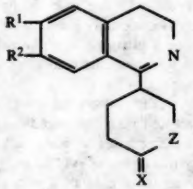
Filed Apr. 10, 1985, Ser. No. 721,880

Claims priority, application Hungary, Apr. 11, 1984, 1393/84

Int. Cl.[4] A61K *31/47;* **C07D** *217/16*

U.S. Cl. 514—307 **5 Claims**

1. A 1-Cyclohexyl-3,4-dihydroisoquinoline derivative of the formula (I)



(I)

wherein

R^1 and R^2 each independently represents hydrogen, hydroxyl or alkoxy having from 1 to 6 carbon atoms,
X is oxygen and
Z is a $=CH_2$ or $=CH—COOR^3$ group, in which R^3 is hydrogen or alkyl having from 1 to 6 carbon atoms; or
X represents an $=NR^4$ group, in which R^4 is hydrogen or hydroxyl, and
Z is a $=CH—CN$, $=CH_2$ or $=CH—COOR^3$ group, in which R^3 is as defined above,
and an acid addition salt thereof.

4. A pharmaceutical composition comprising as an active ingredient an effective amount of at least one compound of the formula (I) of claim 1 or a physiologically acceptable salt thereof, in association with a pharmaceutical carrier and/or excipient.

4,622,330

ANTIPROTOZOAL 3-AMINO OR SUBSTITUTED AMINO PYRAZOLES

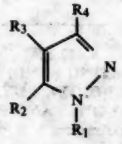
Richard J. Bochis, E. Brunswick; Richard A. Dybas, Bridgewater, and Edward F. Rogers, Middletown, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 450,847, Dec. 20, 1982, abandoned. This application Jun. 19, 1984, Ser. No. 622,337

Int. Cl.[4] **A01N** *43/56, 43/78;* **C07D** *231/52, 417/04*

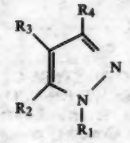
U.S. Cl. 514—313 **7 Claims**

1. A compound having the formula:



wherein:
R_1 is substituted phenyl alkyl (1–3 carbon chain) wherein the substituents are one or more of halogen, cyano, trifluoromethyl, loweralkanol, nitro, loweralkyl, loweralkoxy, carboxy, carbalkoxy (1–3 carbon chain), acetamido, benzoyl, halobenzoyl, trifluoromethylbenzoyl, phenoxy, halophenoxy, trifluoromethylphenoxy, phenyl, halophenyl, trifluoromethylphenyl, phenylthio, phenylsulfinyl, phenylsulfonyl, halo or trifluoromethyl substituted phenylthio, halo or trifluoromethyl substituted phenylsulfinyl, halo or trifluoromethyl substituted phenylsulfonyl, loweralkylthio, loweralkylsulfinyl, or loweralkylsulfonyl, provided that R_1 is unsubstituted phenylalkyl only when R_3 is other than cyano;
R_1 may also be phenacyl, 3-phenyl-2-propenyl, phenoxyethyl, pyridyl, pyridylmethyl, thiazolyl, naphthyl, naphthylmethyl, quinolyl, or quinolylmethyl;
R_2 is amino, mono or diloweralkylamino, acetamido, acetimido, ureido, formamido, formimido or guanidino;
R_3 is carbamoyl, carbazoyl, amidino or N-hydroxycarbamoyl; and
R_4 is hydrogen, loweralkyl, hydroxy, amino, mono or diloweralkylamino, phenyl, cyano, loweralkoxy, loweralkanoyloxy, loweralkylthio, loweralkylsulfinyl, or loweralkylsulfonyl; provided that when R_3 is carbamoyl, R_2 is other than pyridyl.

6. A method for preventing or treating protozoal diseases which comprises administering to an animal in need of such treatment an effective amount of a compound having the formula:



wherein:
R_1 is phenylalkyl (1–3 carbon chain) or substituted phenyl alkyl wherein the substituents are one or more of halogen, cyano, trifluoromethyl, loweralkanoyl, nitro, loweralkyl, loweralkoxy, carboxy, carbalkoxy (1–3 carbon chain), acetamido, benzoyl, halobenzoyl, trifluoromethyl-benzoyl, phenoxy, halophenoxy, trifluoromethyl-phenoxy, phenyl, halophenyl, trifluoromethylphenyl, phenylthio, phenylsulfinyl, phenylsulfonyl, halo or trifluoromethyl substituted phenylthio, halo or trifluoromethyl substituted phenylsulfinyl, halo or trifluoromethyl substituted phenylsulfonyl, loweralkylthio, loweralkylsulfinyl, or loweralkylsulfonyl, provided that R_1 is unsubstituted phenylalkyl only when R_3 is other than cyano;
R_1 may also be phenacyl, 3-phenyl-2-propenyl, phenoxyethyl, pyridyl, pyridylmethyl, thiazolyl, naphthyl, naphthylmethyl, quinolyl, or quinolylmethyl;
R_2 is amino, mono or diloweralkylamino, acetamido, acetimido, ureido, formamido, formimido or quanidino;
R_3 is carbamoyl, cyano, carbazoyl, amidino or N-hydroxycarbamoyl; and
R_4 is hydrogen, loweralkyl, hydroxy, amino, mono or diloweralkylamino, phenyl, cyano, loweralkoxy, loweralkanoyloxy, loweralkylthio, loweralkylsulfinyl, or loweralkylsulfonyl; provided that when R_3 is carbamoyl, R_2 is other than pyridyl.

4,622,331

PHENYLSULPHONAMIDE DERIVATIVES, ANTI-ARRHYTHYMIC COMPOSITIONS AND USE

Ljerka Jozic, Hanover, Fed. Rep. of Germany, assignor to Johann A. Wuelfing, Fed. Rep. of Germany

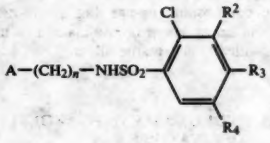
Continuation of Ser. No. 477,071, Mar. 21, 1983, abandoned, which is a division of Ser. No. 348,212, Feb. 12, 1982, Pat. No. 4,396,622, which is a continuation of Ser. No. 148,140, May 9, 1980, abandoned. This application May 31, 1985, Ser. No. 740,175

Claims priority, application United Kingdom, May 23, 1979, 7917892

Int. Cl.[4] **A61K** *31/445;* **C07D** *295/12*

U.S. Cl. 514—331 **6 Claims**

1. A compound selected from the group consisting of sulfonamide of the formula:



and the pharmaceutically acceptable salts thereof
wherein
A is a cyclic amino radical selected from the group consisting of piperidino, 2-methylpiperidino and 2,4-dimethylpiperidino,
n has a value of 2 or 3, and
each of R_2, R_3 and R_4 is hydrogen or chloro, at least two of R_2, R_3 and R_4 being chloro.

6. A pharmaceutical composition, comprising an amount of a compound according to claim 1 sufficient to effect an anti-

arrhythmic response in combination with a pharmaceutical carrier.

4,622,332

ASYMMETRIC DIESTERS OF HANTZSCH DIHYDROPYRIDINES WITH HYPOTENSIVE ACTIVITY

Egbert Wehinger; Horst Meyer, and Andreas Knorr, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

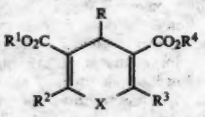
Filed Feb. 22, 1983, Ser. No. 468,621

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208628

Int. Cl.[4] C07D *211/86;* A61K *31/455*

U.S. Cl. 514—356 12 Claims

1. An asymmetrical compound of the formula



in which

R represents phenyl or naphthyl optionally containing 1 to 2 identical or different substituents from the group consisting of phenyl, alkyl, alkoxy, alkylene, dioxyalkylene, halogen, trifluoromethyl, polyfluoroalkoxy, nitro, cyano, azido and SO_m-alkyl (m=0 to 2),

R^1 represents a straight-chain, branched or cyclic, saturated or unsaturated hydrocarbon radical, which is optionally interrupted by 1 oxygen atom in the chain, and/or which is optionally substituted by halogen, hydroxyl, phenyl, phenoxy, or by an amino group which in turn is optionally substituted by 2 identical or different substituents from the group consisting of alkyl having 1 to 4 carbon atoms, phenyl and benzyl,

R^4 represents a straight-chain, branched or cyclic, saturated or unsaturated aliphatic hydrocarbon radical having 7 to 14 carbon atoms, which is optionally interrupted by one oxygen atom and/or which is optionally substituted by halogen or hydroxyl,

R^2 and R^3 are identical or different and each represent hydrogen, a straight-chain or branched alkyl radical, a phenyl radical or a benzyl radical, or, for the case where one of the substituents R^2 or R^3 has the above-mentioned meaning, the other represents hydroxymethyl, acetoxymethyl or amino, and X represents N—R^5,

wherein

R^5 represents hydrogen, a straight-chain or branched alkyl radical, which is optionally interrupted by an oxygen atom, a phenyl radical or a benzyl radical,

or a pharmaceutically acceptable acid addition salt thereof.

9. A hypotensive composition comprising a hypotensive amount of a compound or salt according to claim 1 in admixture with a pharmaceutically acceptable diluent.

4,622,333

FUNGICIDAL HYDROXYALKYNYL-AZOLYL DERIVATIVES

Reinhard Lantzsch, Leverkusen; Klaus Ditgens, Wuppertal; Karl H. Büchel, Burscheid; Paul Reinecke, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

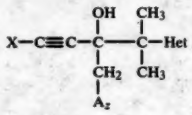
Filed Nov. 1, 1983, Ser. No. 547,806

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242222

Int. Cl.[4] A01N *43/50, 43/653;* C07D *405/6*

U.S. Cl. 514—383 7 Claims

1. A hydroxyalkynyl-azolyl derivative of the formula



in which

Az is 1,2,4-triazol-1-yl or imidazol-1-yl,

X is phenyl which is optionally substituted by substituents independently selected from halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, hydroximinomethyl, 1-hydroximinoethyl, methoximinomethyl, 1-methoximinoethyl, and phenyl, phenoxy, benzyl and benzyloxy in each case optionally substituted by halogen or alkyl with 1 or 2 carbon atoms,

Het is dioxolan-2-yl or 1,3-dioxanyl in each case optionally substituted by substituents independently selected from alkyl with 1 to 4 carbon atoms, and phenyl and phenoxyalkyl with 1 to 4 carbon atoms in the alkyl part in each case optionally substituted on the phenyl by substituents independently selected from halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, and halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms,

or an addition product thereof with an acid or metal salt.

5. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product according to claim 1 plus a diluent.

4,622,334

COMBATING FUNGI WITH 3-CYCLOALKYL-1-(1,3-DIOXAN-5-YL)2-(1,2,4-TRIAZOL-1-YL)-PROPAN-1-ONES AND PROPAN-1-OLS

Wolf Reiser; Wolfgang Krämer, both of Wuppertal; Karl H. Büchel, Burscheid; Wilhelm Brandes, Leichlingen, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

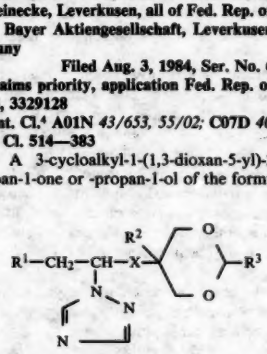
Filed Aug. 3, 1984, Ser. No. 637,451

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329128

Int. Cl.[4] A01N *43/653, 55/02;* C07D *405/06;* C07F *3/00*

U.S. Cl. 514—383 8 Claims

1. A 3-cycloalkyl-1-(1,3-dioxan-5-yl)-2-(1,2,4-triazol-1-yl)-propan-1-one or -propan-1-ol of the formula

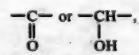


in which

R^1 is cycloalkyl which has 3 to 9 carbon atoms and is optionally substituted by alkyl with up to 4 carbon atoms, and

R^2 and R^3 each independently is hydrogen or alkyl with up to 4 carbon atoms and

X is



or a plant-tolerated addition product with an acid or metal salt.

5. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product according to claim 1 in admixture with a diluent.

4,622,335
FUNGICIDAL HYDROXYETHYLAZOLYL-OXIME DERIVATIVES

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Graham Holmwood, Wuppertal; Paul Reinecke, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

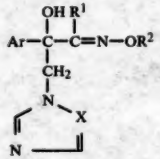
Filed Sep. 11, 1984, Ser. No. 645,464

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334781; Feb. 27, 1984, 3407005

Int. Cl.[4] **A01N** *43/50, 43/653;* **C07D** *233/60, 249/08*

U.S. Cl. 514—383 **12 Claims**

1. A hydroxyethylazolyl-oxime derivative of the formula



in which

Ar is naphthyl, or is phenyl which is optionally substituted by halogen, alkyl with 1 to 4 carbon atoms, alkoxy or alkylthio with in each case 1 or 2 carbon atoms, nitro, halogenoalkyl, halogenoalkoxy or halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, hydroximinomethyl, alkoximinomethyl with 1 to 4 carbon atoms in the alkyl part, alkenyloximinomethyl with 2 to 4 carbon atoms in the alkenyl part, and/or phenyl, phenoxy, benzyl or benzyloxy, each of which is optionally substituted by halogen and/or alkyl with 1 or 2 carbon atoms,

R^1 is hydrogen or alkyl with 1 to 4 carbon atoms, and

R^2 is alkyl with 1 to 4 carbon atoms, or alkenyl or alkinyl with in each case 2 to 6 carbon atoms, or is phenylalkyl which has 1 to 2 carbon atoms in the alkyl part and is optionally substituted on the phenyl by the substituents on phenyl mentioned for Ar, or is cycloalkylmethyl which has 5 or 6 carbon atoms in the cycloalkyl part and optionally mono-, di- or tri-substituted by identical or different alkyl radicals with 1 to 3 carbon atoms, and

X is a nitrogen atom or the CH group,

or an addition product thereof with an acid or metal salt.

10. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product according to claim 1 in admixture with a diluent.

4,622,336
3,3-DIALKYL-AND 3,3-ALKYLENE-INDOLINE DERIVATIVES, PROCESSES FOR THEIR PRODUCTION AND PHARMACEUTICAL COMPOSITIONS COMPRISING THEM

Roland Achini, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

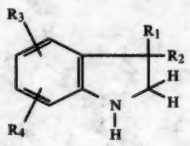
Filed Jan. 17, 1985, Ser. No. 458,443

Claims priority, application Switzerland, Jan. 21, 1982, 373/82; Jun. 17, 1982, 3745/82

Int. Cl.[4] **C07D** *209/08, 209/54;* **A61K** *31/40*

U.S. Cl. 514—409 **14 Claims**

1. A method of treating pain in a subject in need of such treatment which comprises administering to said subject an analgesically effective amount of an indoline of formula I:



(I)

wherein

R_1 and R_2 are each independently C_{1-3}alkyl or together are $-(CH_2)_n-$, wherein n is 2 to 5,

R_3 is

(a) hydroxy or C_{1-6}alkoxy in the 4- or 6-position, or

(b) C_{1-6}alkoxy in the 5- or 7-position and R_4 is hydrogen or C_{1-3}alkyl, or a physiologically-hydrolysable and -acceptable ester thereof, or of a pharmaceutically acceptable acid addition salt thereof.

4,622,337
2,2-DIMETHYL-3-(2-HALOVINYL)CYCLOPROPANE CARBOXLIC ACID ESTER PESTICIDES

Michael Elliott, Hertfordshire; Norman F. Janes, Bedfordshire, and David A. Pulman, Hertfordshire, all of England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 172,943, Jul. 28, 1980, Pat. No. 4,464,391, which is a continuation-in-part of Ser. No. 764,895, Feb. 2, 1977, abandoned, which is a continuation of Ser. No. 497,056, Aug. 13, 1974, Pat. No. 4,024,163, which is a continuation-in-part of Ser. No. 363,318, May 24, 1973, abandoned, and a continuation-in-part of Ser. No. 40,304, May 18, 1979, abandoned, and a continuation-in-part of Ser. No. 962,025, Nov. 20, 1978, abandoned. This application May 22, 1984, Ser. No. 612,807

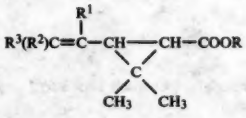
Claims priority, application United Kingdom, May 25, 1972, 24810/72; May 25, 1972, 24809/72; Jun. 30, 1972, 30838/72; Dec. 21, 1972, 59184/72; Apr. 30, 1973, 20539/73; Aug. 15, 1973, 39539/73; Oct. 22, 1973, 49098/73; Jun. 13, 1974, 26316/74; Nov. 21, 1977, 48454/77; May 25, 1978, 22638/78; May 25, 1978, 22639/78

The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.

Int. Cl.[4] **A01N** *53/00;* **C07C** *69/743, 69/747;* **C07D** *307/54*

U.S. Cl. 514—461 **12 Claims**

1. A compound of the general formula II:



II

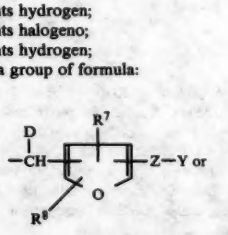
wherein:

R^1 represents hydrogen;

R^2 represents halogeno;

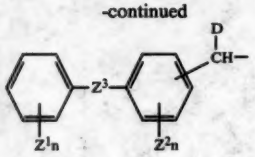
R^3 represents hydrogen;

R represents a group of formula:



III

-continued



VI

wherein:

Z represents CH_2;

Y represents an aryl group which is unsubstituted or substituted in the ring by at least one lower alkyl group;

R^7 and R^8 each represent hydrogen or a lower alkyl group;

D represents H or CN;

Z^3 represents 0, CH_2 or CO;

Z^1 and Z^2 independently represent chlorine or a methyl group;

n=0, 1 or 2.

12. A method of pest control which comprises applying to a pest or an environment susceptible to pest attack a pesticidally effective amount of a compound according to claim **1**.

4,622,338

SUBSTITUTED GLUTARIC ACID LACTONES IN THE TREATMENT OF HYPERLIPIDEMIA

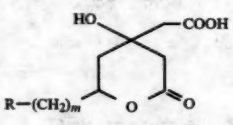
John S. Baran, Winnetka; Thomas J. Lindberg, Wheaton, and Harman S. Lowrie, Northbrook, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Mar. 11, 1985, Ser. No. 710,375

Int. Cl.[4] A61K *31/365;* **C07D** *309/30*

U.S. Cl. 514—460 **14 Claims**

1. A compound of the formula



wherein

R represents lower alkyl, cycloalkyl of 3 to 7 carbon atoms, inclusive, phenyl

or a group of the formula

wherein R^1 represents cycloalkyl of 3 to 7 carbon atoms, inclusive, or phenyl; m is an integer from 8 to 15, inclusive; and the pharmaceutically acceptable carboxylic acid salts or lower alkyl esters thereof.

12. A method of promoting an antihyperlipidemic effect in a mammal in need thereof comprising administering thereto a non-toxic therapeutically effective amount of a compound according to claim **1**.

4,622,339

NOVEL NORBORNANE- AND NORBORNENE-CARBOXYLIC ACID AMIDES THROMBOXAN ANTAGONISTS

Folker Lieb, Leverkusen; Hermann Oediger, Cologne; Hans-Joachim Kabbe, Leverkusen; Ulrich Niewöhner, Wermelskirchen; Elisabeth Perzborn, and Friedel Seuter, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

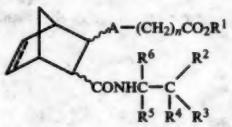
Filed Jan. 11, 1985, Ser. No. 691,088

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401949

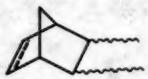
Int. Cl.[4] A61K *31/44, 31/19;* **C07C** *59/46*

U.S. Cl. 514—563 **12 Claims**

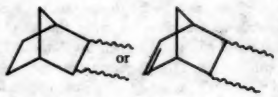
1. A norbornane- or norbornene-carboxylic acid amide of the general formula



in which



represents the part structure



A represents a

or $-CH_2-CH_2-$ group,

R^1 and R^2 each independently is hydrogen or an alkyl radical with 1–6 carbon atoms,

R^3 is alkyl or alkenyl which has 1–8 carbon atoms and is optionally substituted by halogen or alkyl with 1 or 2 carbon atoms, cycloalkyl or cycloalkeny with 3 to 7 carbon atoms, an aromatic radical which has 6 or 10 carbon atoms and and is optionally substituted by halogen, by alkyl with 1 or 2 carbon atoms or by halogenoalkyl with 1 or 2 carbon atoms, or is pyridyl, imidazolyl, furyl or thionyl,

R^4 is hydrogen or a hydroxyl group,

R^5 and R^6 each independently is hydrogen or alkyl with 1 to 4 carbon atoms, and

n is a number from 2 to 6,

and, if R^1 is hydrogen, also a physiologically acceptable salt thereof.

9. A thromboxan antagonistic composition comprising an amount effective therefor of a compound or salt according to claim **1** in admixture with a diluent.

11. A method of antagonizing thromboxan in a patient which comprises administering to such patient a thromboxan-antagonizing effective amount of a compound or salt according to claim **1**.

4,622,340

UREA DERIVATIVES AND PESTICIDAL COMPOSITIONS CONTAINING SAME

Heinz-Manfred Becher, Bingen; Ricarda Prokic-Immel, Mainz, and Walter Wirtz, Darmstadt, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co., KG, Ingelheim am Rhein, Fed. Rep. of Germany

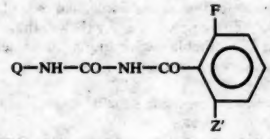
Continuation-in-part of Ser. No. 321,446, Nov. 16, 1981, Pat. No. 4,457,943. This application Apr. 26, 1984, Ser. No. 604,371

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1980, 3044055; Jun. 15, 1981, 3123720

Int. Cl.[4] A01N *47/28*; C07C *127/22, 157/12*

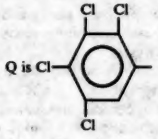
U.S. Cl. 514—594 6 Claims

1. A compound of the formula



(Ia)

wherein



(II)

or

(III)

and

Z' is chlorine or fluorine, with the proviso that Z' is chlorine when Q is the moiety of Formula III.

6. The method of killing insects, acarids, or fungi which comprises contacting same with an effective insecticidal, acaricidal, or fungicidal amount of a compound of claim 1.

4,622,341

GROWTH-PROMOTER FODDERS AND FEED ADDITIVES AND PROCESS FOR THEIR PREPARATION

Ernö Szatlóczky; Ákos Andor; András Vucskits, all of Budapest; Géza Márai, Gödöllö , and Erzsebet Palágyi nee Vajdovics, Budapest, all of Hungary, assignors to Novotrade RT, Budapest, Hungary

Filed Apr. 12, 1984, Ser. No. 599,465

Claims priority, application Hungary, Apr. 14, 1983, 1305/83

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—648 6 Claims

1. A method of promoting the growth of an animal which comprises feeding a small but effective amount of prenylamine or a salt thereof, suitable for feeding purposes, to said animal.

4,622,342

SECONDARY AMINES

Barrie C. C. Cantello, Redhill, and Richard M. Hindley, Reigate, both of England, assignors to Beecham Group P.L.C., England

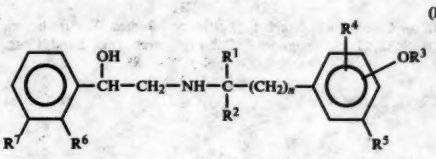
Continuation of Ser. No. 396,719, Jul. 9, 1982, abandoned. This application Nov. 2, 1984, Ser. No. 667,548

Claims priority, application United Kingdom, Jul. 11, 1981, 8121444; Mar. 10, 1982, 8207005

Int. Cl.[4] C07C *91/06*; A61K *31/13*

U.S. Cl. 514—653 21 Claims

1. A compound of formula (II):



(II)

or salt thereof; wherein

R^1 is hydrogen or methyl,

R^2 is hydrogen or methyl,

R^3 is hydrogen, C_{1-12} straight or branched alkyl, C_{3-10} cycloalkyl, phenyl(C_{1-4})-alkyl or benzyl optionally substituted by C_{1-4} alkyl, C_{1-4} alkoxy or halogen;

R^4 is hydrogen, halogen, hydroxy, C_{1-4} alkyl or C_{1-4} alkoxy,

R^5 is hydrogen or fluorine,

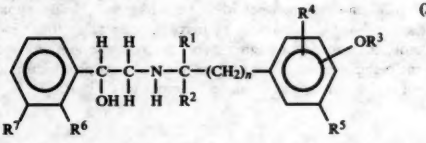
R^6 is hydrogen or fluorine,

R^7 is halogen; and

n is 1 or 2,

provided that when R^1, R^2, R^5 and R^6 are each hydrogen, $-OR^3$ is p-methoxy, R^4 is methoxy, R^7 is chloro and n is 1, then R^4 is ortho to the group $-(CH_2)_n-$.

7. A pharmaceutical composition comprising a compound of formula (X):



(X)

or a salt thereof; wherein

R^1 is hydrogen or methyl,

R^2 is hydrogen or methyl,

R^3 is hydrogen, C_{1-2} straight or branched alkyl C_{3-10} cycloakyl or phenyl (C_{1-4}) alkyl or benzyl optionally substituted by C_{1-4} alkyl, C_{1-4} alkoxy or halogen;

R^4 is hydrogen, halogen, hydroxy, C_{1-4} alkyl or C_{1-4} alkoxy,

R^5 is hydrogen or fluorine,

R^6 is hydrogen or fluorine,

R^7 is halogen, and

n is 1 or 2,

in association with a pharmaceutically acceptable carrier.

4,622,343

PROCESS FOR C_1–C_4 ALKANOL PRODUCTION FROM SYNTHESIS GAS USING A TRIMETALLIC CATALYST

John F. Knifton, and Neal J. Grice, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,261

Int. Cl.[4] C07C *27/06*

U.S. Cl. 518—700 19 Claims

1. A process for making C_1–C_4 alkanols which comprises contacting a mixture of synthesis gas (e.g. carbon monoxide and hydrogen) at a pressure of at least 30 atm and at a temperature of at least 150° C. with a trimetallic catalyst system com-

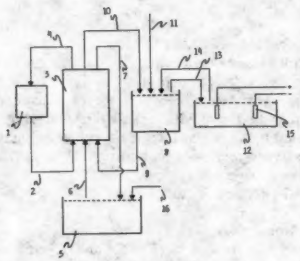
prising a ruthenium-containing compound, a cobalt-containing compound and a manganese-containing compound dispersed in a low melting quaternary phosphonium salt wherein there is one or more of the following: improved total C_1–C_4 alcohol + C_1–C_4 alkyl acetate productivity, improved selectivity for total C_1–C_4 alkanols, improved ethanol productivity, and improved C_1–C_4 alcohol to C_1–C_4 alkyl acetate molar ratio.

4,622,344

RECOVERY OF AMMONIACAL COPPER WITH NOVEL ORGANOGELS

Walter C. Babcock; Mark E. Tuttle, and James W. Brooke, all of Bend, Oreg., assignors to Bend Research, Inc., Bend, Oreg.

Filed Mar. 5, 1984, Ser. No. 585,977
Int. Cl.[4] C08D 5/20
U.S. Cl. 521—28 10 Claims



1. A copper ion-exchange gel comprising a hydrophobic nonporous polymer plasticized and swollen with a monomeric organic liquid copper ion-exchange agent selected from one or more of 1-n-octyl-phenyl-p-1,3-butanedione and alkyl-, aryl-, and halogen-substituted amides, beta-diketones, hydroxyoximes, sulfonamido oximes, hydroxyquniolines, sulfonamido quinolines, macrocyclic ethers, and macrocyclic amines, said agent being present in an amount sufficient to plasticize and swell said polymer and to extract copper metal ions.

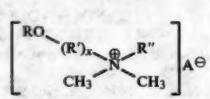
4,622,345

ANTI-STATIC STYRENE POLYMER PARTICLES

Haven S. Kesling, Jr., Drexel Hill, and James J. Harris, West Chester, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 812,090, Dec. 23, 1985, Pat. No. 4,599,366.
This application May 1, 1986, Ser. No. 858,333
Int. Cl.[4] C08J 9/22
U.S. Cl. 521—57 6 Claims

1. A composition comprising a styrene polymer containing dispersed throughout 3 to 20 weight percent of a blowing agent and coated on the surface thereof by 0.1 to 0.4 weight percent of a mixture of esters having general formula



wherein R may be C_1–C_{11} linear or branched alkyl groups and mixtures thereof, R′ may be oxyethylene, oxypropylene, oxybutylene and mixtures thereof, R″ may be C_1–C_4 linear or branched alkyl, hydroxylalkyl, or benzyl, x may be an integer from 6 to 20 and A may be any anion.

4,622,346

PROCESS FOR PRODUCING MODIFIED STYRENIC POLYMER BEADS FOR HIGH STRENGTH FOAMED ARTICLES

Adolph V. DiGiulio, Wayne, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 29, 1985, Ser. No. 802,901
Int. Cl.[4] C08J 9/18
U.S. Cl. 521—59 3 Claims

1. The process for forming styrene polymer beads having a styrene monomer-divinylbenzene copolymer relatively uniformly dispersed throughout the bead for use in producing foamed cups with improved strength and thermal properties comprising:

(a) forming an aqueous suspension of initial polystyrene beads having a weight average molecular weight of 230,000 to 350,000 with a polydispersity (Mw/Mn) of 2 to 3.1, with the aid of a suitable suspending agent system;

(b) forming a comonomer solution of styrene monomer and divinylbenzene;

(c) forming an emulsion comprising suitable emulsifier and a portion of said comonomer solution;

(d) adding the emulsion to the styrene polymer bead suspension at 25°–75° C. to allow the comonomers to be absorbed into the beads;

(e) forming a second emulsion comprising a suitable emulsifier, the remaining portion of said comonomer solution, and free-radical-producing catalysts;

(f) adding the second emulsion to the suspension of said beads absorbed with comonomers at 25°–75° C., at a rate such that the rate of absorption of comonomer/catalyst by said beads is at least equivalent to the rate of addition of emulsified comonomer/catalyst solution, then allowing said suspension to stand for 30 minutes to 4 hours, and then raising the temperature to 80°–95° C., and maintaining the suspension at said temperature to polymerize said comonomers; and

(g) heating said suspension at a temperature of 115° C. to about 135° C. to substantially complete the polymerization of said styrene monomer and divinylbenzene to form beads having copolymer relatively uniformly distributed throughout the beads;

(h) cooling the suspension to 105° C. or less;

(i) adding a non-ionic surfactant and 3–12% by weight based on polymer of a blowing agent selected from the group consisting of aliphatic hydrocarbons containing 4 to 6 carbon atoms, halogenated hydrocarbons which boil at a temperature below the softening point of the polymer, and mixtures of these;

(j) heating the suspension at a temperature of from 80°–150° C. to impregnate the polymer beads with blowing agent; and

(k) cooling the suspension to room temperature, acidifying the suspension, and separating the impregnated beads from the aqueous system.

4,622,347

EXPANDABLE POLYPROPYLENE INTERPOLYMER PARTICLES

Kent D. Fudge, Glen Mills, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 7, 1986, Ser. No. 848,560
Int. Cl.[4] C08J 9/18, 9/22
U.S. Cl. 521—81 12 Claims

1. A process for producing expandable polypropylene particles comprising

(a) suspending in an aqueous medium, a copolymer of propylene and sufficient olefin comonomers to give said copolymer a melting peak of less than 140° C., with the aid of a suitable suspending agent system;

(b) adding to said suspension vinyl aromatic monomer and a catalyst system such that the amount of monomer is 40 to 80% by weight based on copolymer plus monomer;

(c) polymerizing said monomer in the interior of said copolymer to form a polypropylene-polyvinylaromatic monomer interpolymer;
(d) separating said interpolymer from said suspension by acidifying, filtering, washing with water and drying in air;
(e) extruding said interpolymer in admixture with a lubricant and cell control agent and a peroxide, if used, to viscbreak said interpolymer to a melt flow (condition L) of at least 10, under conditions to minimize orientation stress in the final extrudate;
(f) impregnating said extrudate with a blowing agent to give expandable polypropylene-polyvinyl aromatic monomer interpolymers which can be expanded at 100° C. to fine cell structure foams of density less than 2.0 pounds per cubic foot.

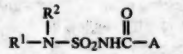
4,622,348

CHLOROSULFONYL ISOCYANATE DERIVATIVES AS ANAEROBIC ACCELERATORS

Anthony F. Jacobine, Meriden, and David M. Glaser, New Britain, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Nov. 27, 1984, Ser. No. 675,387
Int. Cl.[4] C08F 4/00, 20/10
U.S. Cl. 522—27 21 Claims

1. A free radical curable composition comprising
an acrylate or methacrylate compound; an accelerator compound of the formula:



where A is OR^3, OOR^3, or NR^1R^2; R^1 is H or an organo group, and R^2 and R^3 are the same or different organo groups; and a compound, which may be the same as or different from the accelerator compound, which is a source of free radicals for cure initiation.

4,622,349

BLENDS OF EPOXIDES AND MONOEPOXIDES

Joseph V. Koleske, Charleston, W. Va., and Neil J. McCarthy, Jr., Brookfield, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 7, 1983, Ser. No. 464,558
Int. Cl.[4] C08F 2/50; C08G 59/62, 59/24
U.S. Cl. 522—31 5 Claims

1. A photocopolymerizable composition comprising:
(a) an epoxide containing two or more epoxy groups,
(b) a hydroxyl substituted cycloaliphatic monoepoxide of the formula:

and
(c) a photoinitiator selected from diazonium salts or onium salts or mixtures thereof;
(d) a poly(active hydrogen) organic compound containing at least two active hydrogens per molecule; and
(e) a vinyl substituted cycloaliphatic monoepoxide.

4,622,350

LOW SMOKE POLYPROPYLENE INSULATION COMPOSITIONS

Ronald D. Icenogle, Spokane, Wash., and Lie K. Djiauw, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1985, Ser. No. 814,706
Int. Cl.[4] C08K 9/06, 9/04, 3/22
U.S. Cl. 523—200 19 Claims

1. A flame retardant insulation composition comprising:
(a) 5–40 percent by weight of a hydrogenated monoalkyarene (A)-conjugated diene (B) block copolymer containing at least two A blocks and at least one B block;
(b) 1–20 percent by weight of a plasticizer;
(c) 1–40 percent by weight of polypropylene;
(d) 0.25–10 percent by weight of a functionalized low molecular weight polypropylene wax;
(e) 10–85 percent by weight of a hydrated inorganic filler.

4,622,351

RUBBER-REINFORCED POLYMERIC RESINS CONTAINING A MINERAL FIBER

Dinh P. Van, Gent, Belgium, assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 15, 1985, Ser. No. 702,111
Claims priority, application Netherlands, Feb. 21, 1984, 8400549
Int. Cl.[4] C08L 51/04; C08K 9/06, 7/14, 3/40
U.S. Cl. 523—212 14 Claims

1. A composite comprising a resin of a polymer of one or more monovinylidene aromatic compound(s) having discrete particles of a rubber and mineral fiber, having a diameter from about 1 to about 100 micrometers, dispersed throughout the polymer matrix phase of the resin wherein the ratio of the dimaeter of the mineral fiber to the volume average particle size of the disperse rubber particles is less than about 20:1.

4,622,352

LOW SMOKE MODIFIED POLYPROPYLENE INSULATION COMPOSITIONS

Lie K. Djiauw, Houston, Tex., and Ronald D. Icenogle, Spokane, Wash., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1985, Ser. No. 814,705
Int. Cl.[4] C08K 9/06, 9/04, 3/22
U.S. Cl. 523—200 11 Claims

1. A flame retardant insulation composition comprising:
(a) 5–40 percent by weight of a hydrogenated monoalkyarene (A)-conjugated diene (B) block copolymer containing at least two A blocks and at least one B block;
(b) 1–20 percent by weight of a plasticizer;
(c) 1–40 percent by weight of functionalized polypropylene;
(d) 0.25–10 percent by weight of a functionalized low molecular weight polypropylene wax; and
(e) 10–85 percent by weight of a hydrated inorganic filler.

4,622,353

EPOXY RESIN-DIAMMONIUM SALT EMULSION AND PROCESS FOR ITS PRODUCTION

Jörn-Volker Weiss, Haltern, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,474
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345399
Int. Cl.[4] C08L 63/00; C08K 5/16; C08J 3/06
U.S. Cl. 523—401 24 Claims

1. A stable epoxy resin-diammonium salt emulsion comprising
(a) a liquid epoxy resin,
(b) water,
(c) an emulsifying means comprising at least one of
I. a polyvinyl alcohol obtained by saponification of polyvinyl acetate with a degree of hydrolysis of at least 70% and a molecular weight of at least 5,000,

II. a polyoxazoline having a molecular weight of 10,000–100,000, or

III. a copolymer of N-vinylpyrrolidone with

vinyl esters of mono- or dibasic carboxylic acids of up to 6 carbon atoms,

(meth)acrylic esters of mono- and dihydric alcohols of up to 6 carbon atoms,

maleic, fumaric, crotonic acid or

styrene, and

(d) a latent curing agent comprising a salt of

I. a diamine of the formula $H_2N—CH_2—R—NH_2$, or $H_2N—R—CH_2—R—NH_2$ wherein R is a member selected from the group consisting essentially of

an unsubstituted C_{4-9}-alkylene residue, or a C_{4-9}-alkylene residue substituted by oxygen,

an unsubstituted C_{6-9}-cyclo-alkylene residue, or a C_{6-9}-cyclo-alkylene residue substituted by oxygen, and

a C_{7-9}-arylkylene residue, with

II. an aliphatic, cycloaliphatic, or aromatic mono- or dicarboxylic acids of up to 12 carbon atoms, said latent curing agent exhibiting curing properties only in the presence of an alkaline agent.

4,622,354

PHASE STABILIZED POLYESTER MOLDING MATERIAL

Kenneth A. Iseler, Richmond; Probir K. Guha, Mt. Clemens, and Robert C. Yen, Troy, all of Mich., assignors to The Budd Company, Troy, Mich.

Filed Oct. 22, 1985, Ser. No. 790,096

Int. Cl.[4] C08L 67/00; C08K 3/40

U.S. Cl. 523—527 **54 Claims**

1. A phase-stabilized sheet molding composition comprising:

(a) an unsaturated polyester resin having a ratio of hydroxyl groups to carboxyl groups of approximately 5.7 to 0.8, an acid number of at least 14 and an average molecular weight of approximately 800 to 5,000;

(b) a phase-stabilizing agent selected from the group consisting of:

(i) a fatty acid having from about 5 to about 28 carbon atoms;

(ii) a dimer or trimer acid having from about 20 to about 54 carbon atoms; or

(iii) a polyester polyol containing polyester polyol, said polyol having an average molecular weight of about 200 to about 6,500 and an average functionality of about 2 to about 4; or mixtures of (i), (ii), or (iii);

(c) an ethylinically unsaturated monomer and a free radical polymerization catalyst;

(d) an inert filler;

(e) a fiberous reinforcing material;

(f) a mold release agent;

(g) an isocyanate terminated urethane prepolymer dual functional additive having an equivalent ratio of NCO to OH from about 1.2/1 to about 5/1, comprising a polyol and a polyisocyanate, and being prepared by reacting:

(i) one equivalent weight of a polyol having an average molecular weight of about 600 to 4,000 and an average funtionality of approximately 2 to approximately 6; and

(ii) 1.2 to 5 equivalent weights of a polyisocyanate selected from the group consisting of 80:20 or 65:35 isomer mixture of the 2,4- and 2,6-isomeric forms of toluene di-isocyanate, ethylene di-isocyanate, propylene di-isocyanate, meta- and para-phenyl di-isocyanate, 4,4'-diphenyl methane di-isocyanate (MDI) or a mixture of MDI and its trifunctional cyclic adduct products containing carbodiimide linkages, 1,5-napthalene di-isocyanate, para- and meta-xylene di-isocyanates, alkylene di-isocyanates, or polymeric MDI containing an average of two isocyanate groups per molecule, toluene di-isocyanate, polyisocyanate prepolymers of aromatic type, toluene di-isocyanate based adducts, aromatic/aliphatic polyisocyanates and polyfunctional aliphatic isocyanates;

wherein said reactants combine in a one-step addition process to yield an isocyanate terminated urethane prepolymer of controlled molecule weight to impart improved low shrink, by covalently binding to the polyester resin matrix;

(h) Group IIA metallic oxide or hydroxide; and

(i) a linear oligomer of approximately 400 to 200,000 molecular weight; or mixtures of such oligomers;

wherein said oxides and hydroxides

(i) are present in an amount sufficient to react with at least 30 percent, but not more than 75 percent of the carboxyl groups present; and

(ii) said prepolymer is present in an amount sufficient to react with at least 10 percent, but not more than 105 percent of the hydroxyl groups present thereby forming an SMC of improved Class A quality finish.

4,622,355

RADIATION-HARDENED POLYMERIC FILMS

Charles Arnold, Jr.; Robert C. Hughes; R. Glen Kepler, and Steven R. Kurtz, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 16, 1984, Ser. No. 632,347

Int. Cl.[4] C08J 5/34

U.S. Cl. 524—89 **14 Claims**

1. Polymeric dielectric compositions with reduced radiation-induced conductivity, containing from about 10^{15} to 10^{21} molecules/cm^3 of a compatible organic Lewis acid or Lewis base as dopant, said dielectric being a low electronic mobility polymer selected from the group consisting of polyesters, polyolefins, perfluorinated polyolefins, vinyl polymers, vinylidene polymers, polycarbonates, polysulfones, and polyimides.

4,622,356

POLYACRYLAMIDE AND POLYACRYLIC ACID POLYMERS

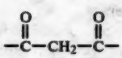
Peter A. Jarovitzky, and Roger E. Neff, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 532,340, Sep. 15, 1983, Pat. No. 4,568,731, which is a continuation of Ser. No. 155,733, Jun. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 89,803, Oct. 31, 1979, abandoned. This application Jul. 10, 1985, Ser. No. 753,466

Int. Cl.[4] C08F 2/00, 4/00

U.S. Cl. 524—100 **12 Claims**

1. In a process for producing a water-soluble high molecular weight polymer by polymerizing a monomer selected from acrylamide, acrylic acid, 2-acrylamido-2-methylpropane sulfonic acid and its salts, or mixtures thereof, and drying the resulting polymer, the improvement comprising adding to said polymer, after polymerization and before drying, a cyclic organic compound which contains a 1,3-dione moiety of the formula:



4,622,357

PRESSURE-SENSITIVE ADHESIVE COMPOSITIONS

Seiichi Tsuchida, Sakai; Yoshihiro Kodama, Kobe, and Hiroari Hara, Osaka, all of Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Japan

PCT No. PCT/JP84/00350, § 371 Date Mar. 8, 1985, § 102(e) Date Mar. 8, 1985, PCT Pub. No. WO85/00376, PCT Pub. Date Jan. 31, 1985

PCT Filed Jul. 9, 1984, Ser. No. 713,395

Claims priority, application Japan, Jul. 13, 1983, 58-128159

Int. Cl.[4] C09J 3/12; C08L 9/06

U.S. Cl. 524—270 10 Claims

1. A pressure-sensitive adhesive composition comprising a block rubber, a tackifying resin and a plasticizer as major components, the composition being characterized in that the tackifying resin is partially fumarized and/or partially maleinized, disproportionated rosin ester.

4,622,358

CONCENTRATED EMULSIONS OF OLEFIN COPOLYMERS

Horst Pennewiss, Darmstadt-Neu-Kranichstein; Roland Schweder, Darmstadt-Kranichstein, and Helmut Knoell, Lautertal, all of Fed. Rep. of Germany, assignors to GmbH Röhm, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 468,185, Feb. 22, 1983, abandoned.

This application Mar. 29, 1985, Ser. No. 718,185

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1982, 3207292

Int. Cl.[4] C08K 5/12

U.S. Cl. 524—297 10 Claims

1. A method for making a concentrated polymer emulsion consisting of 20 to 65 percent, by weight of the emulsion, of a polymer in a liquid carrier medium together with an emulsifier, which method comprises dissolving said emulsifier in said liquid carrier medium and then emulsifying said polymer therein with shearing forces, said polymer being selected from the group consisting of hydrogenated polyisoprene, hydrogenated butadiene/isoprene, and olefin copolymers formed between alpha-olefins having 2 to 20 carbon atoms, said emulsifier being a graft or block copolymer of the formula

A—Y

wherein A is a polymer segment selected from the group consisting of hydrogenated polyisoprene, hydrogenated butadiene/isoprene, and olefin copolymers formed between alpha-olefins having 2 to 20 carbon atoms, and Y is at least one polymer segment formed by the polymerization of certain vinyl monomers selected from the group consisting of

(a) at least one monomer of the formula

$$H_2C=C(R_1)(CH_2)_nZ,$$

wherein R_1 is hydrogen or methyl, n is 0 or 1, Z is $—OR_2$, $—COR_3$, $—OCOR_3$, or chlorine, and R_2 and R_3 are phenyl or alkyl having 1 to 20 carbon atoms, and

(b) up to 60 percent, by weight of (a), of at least one monomer of the formula

$$H_2C=C(R_1)B_z$$

wherein R_1 is hydrogen or methyl and B_z is —CN, $—CH_2OH$, pyridine, pyrrolidine, imidazole, carbazole, lactam, or $—CONR_8R_9$, where R_8 and R_9, taken alone, are hydrogen or alkyl having from 1 to 20 carbon atoms and R_8 and R_9, taken together with the nitrogen atom to which they are bound, form a five- or six-membered ring, and

said carrier medium being an ester or higher alcohol having more than 8 carbon atoms which dissolves polymer segment Y of said emulsifier, does not dissolve polymer segment A or said polymer, but which will swell polymer segment A and said polymer to a degree from 5 to 30 percent by weight at a temperature from 40° C. to 150° C.

4,622,359

POLYCARBONATE FILM COMPOSITION EXHIBITING A LOW KINETIC COEFFICIENT OF FRICTION AND COMPRISING GLASS PARTICLES AND FATTY ACID

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Aug. 20, 1985, Ser. No. 767,370

Int. Cl.[4] C08L 69/00

U.S. Cl. 524—322 32 Claims

1. An improved aromatic carbonate resin film forming composition exhibiting improved kinetic coefficient of friction comprising, in physical admixture, at least one aromatic carbonate resin and from about 0.025 to about 0.6 weight percent of glass particles in the form of fine particles, the improvement comprising said composition containing at least one fatty acid in an amount effective to reduce the kinetic coefficient of friction of said carbonate resin.

4,622,360

COATING COMPOSITION

Tadashi Gomi, Fussa; Kenji Sakata, Fujisawa; Ichiro Aoyama, Yokohama, and Nobuo Sono, Tokyo, all of Japan, assignors to Yuho Chemicals Inc. and Mitsui Toatsu Chemical Inc., both of Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,435

Int. Cl.[4] C08L 75/04

U.S. Cl. 524—507 14 Claims

1. Removable water-borne urethane resin coating composition comprising polyurethane resin containing carboxyl groups and/or carboxylate groups and polyvalent metal complex as a cross-linking agent.

4,622,361

FLAME RETARDED HIGH MODULUS POLYURETHANE ELASTOMERS AND METHOD OF MAKING SAME

William A. Gill, Hurricane, and Richard M. Gerkin, Cross Lanes, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 29, 1985, Ser. No. 717,346

Int. Cl.[4] C08L 75/04

U.S. Cl. 524—710 60 Claims

1. A high modulus polyurethane elastomer having improved combustion resistance comprising the reaction product of a mixture comprising (a) a polyol having a hydroxyl number of from about 20 to about 60, (b) a low molecular weight chain extender, (c) a liquid organic polymeric isocyanate, said isocyanate having an average functionality of at least about 2.4, (d) a catalyst for the reaction of (a) and (b) with (c) and (e) a flame retardant reactant, the improvement which comprises, said flame retardant being present in an amount within the modal minimum concentration for said flame retardant.

4,622,362

POLYACROLEIN MICROSPHERES

Alan Rembaum, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 248,899, Mar. 30, 1981, Pat. No. 4,413,070.

This application Aug. 4, 1983, Ser. No. 520,313

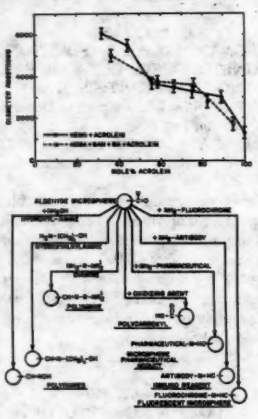
Int. Cl.[4] C08F 2/54, 16/34

U.S. Cl. 525—54.1 11 Claims

1. A composition comprising the adduct of an aldehyde reactive material selected from proteins, pharmaceuticals and fluorescent chromophores with a microsphere of the addition interpolymerizate of a monomer mixture containing:

20 to 90 percent by weight of an addition polymerizable

unsaturated aldehyde selected from acrolein and C_1 to C_8 aryl, alkyl or cycloalkyl derivatives thereof; and



0.1 to 20 percent by weight of an addition copolymerizable, polyunsaturated cross-linking agent.

4,622,363

THERMOPLASTIC MOULDING COMPOSITIONS WITH AN IMPROVED HEAT DISTORTION POINT

Herbert Eichenauer, Dormagen; Hans-Jürgen Kress, Krefeld; Karl-Heinz Ott; Horst Peters, both of Leverkusen, and Josef Buekers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 778,882

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436454

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **2 Claims**

1. Thermoplastic mixtures containing:

(A) 20–75 parts by weight of a thermoplastic aromatic polycarbonate,

(B) 10–50 parts by weight of a graft polymer of:

(B)(1) 5 to 90 parts by weight of a mixture of (B)(1)(1) and (B)(1)(2) wherein (B)(1)(1) is styrene, α-methyl styrene, nuclear-substituted styrene, methyl methacrylate or mixtures thereof and (B)(1)(2) is (meth)acrylonitrile, grafted onto

(B)(2) 95 to 10 parts by weight of a rubber with a glass transition temperature TG ≦ 10° C.

(C) 10–70 parts by weight of a thermoplastic copolymer with a weight-average molecular weight of 15,000 to 200,000 as measured by light scattering or sedimentation and of 50–95% by weight of (C)(1) copolymerized with 50–5% by weight of (C)(2) wherein (C)(1) is styrene, α-methyl styrene, nuclear-substituted styrene, methyl methacrylate, or mixtures thereof, and (C)(2) is (meth)acrylonitrile, and

(D) 0.5–5 parts by weight of a copolymer of 95–50% by weight of vinylaromatic compounds and 5–50% by weight of an ethylenically unsaturated nitrile compound, an ester of (meth)acrylic acid or a mixture of both, the copolymer having a weight average molecular weight of 2×10^6 to 1×10^7 as determined by gel chromatography or by the light scattering method.

4,622,364

FLUORINE-CONTAINING COPOLYMER AND COMPOSITION CONTAINING THE SAME

Akira Ohmori, Ibaraki; Nobuyuki Tomihashi, Takatsuki, and Yoshiki Shimizu, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 722,560, Apr. 12, 1985, Pat. No. 4,588,781, which is a division of Ser. No. 599,134, Apr. 11, 1984, Pat. No. 4,529,785. This application Jan. 9, 1986, Ser. No. 817,330

Int. Cl.[4] C08L *27/12*

U.S. Cl. 525—200 **2 Claims**

1. A composition suitable for forming which comprises

(1) an alternating copolymer comprising chlorotrifluoroethylene and 2,2,3,3-tetrafluoropropyl vinyl ether; and

(2) a methyl methacrylate polymer comprising predominantly methyl methacrylate.

4,622,365

POLYETHER TREATED GUAYULE RESIN AND RUBBER COMPOSITIONS CONTAINING THE SAME

William W. Scholman, Jr., Stow, and James A. Davis, Uniontown, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 2, 1985, Ser. No. 750,954

Int. Cl.[4] C08C *19/22;* **B60C** *1/00*

U.S. Cl. 525—332.5 **18 Claims**

1. A composition of matter, comprising:

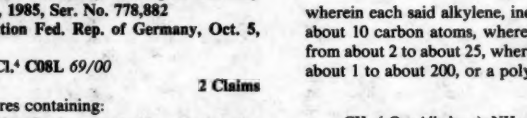
guayule resin chemically crosslinked by treatment with an amine terminated polyether, said polyether having the formula

$$H_2N—Alkylene—O—Alkylene—NH_2 \qquad \text{(Formula 1)}$$

wherein each said alkylene, independently, has from 2 to about 10 carbon atoms, and wherein said n is an integer of from about 2 to about 100, or a polyether having the formula

$$H_2N—Alkylene—O—Alkylene)_j(O—Alkylene)_k(O—Alkylene—)_kNH_2 \qquad \text{(Formula 2)}$$

wherein each said alkylene, independently, has from 2 to about 10 carbon atoms, wherein i plus k is an integer of from about 2 to about 25, wherein said j is an integer from about 1 to about 200, or a polyether having the formula



(Formula 3)

wherein each said alkylene, independently, has from 2 to about 10 carbon atoms, wherein x+y+z is an integer of from about 2 to about 100, and wherein R is hydrogen or an aliphatic group having from 1 to 5 carbon atoms.

4,622,366

URANIUM ADSORBING MATERIAL AND PROCESS FOR PREPARING THE SAME

Takanobu Sugo; Jiro Okamoto; Isao Ishigaki, and Akio Katakai, all of Gunma, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 496,645, May 20, 1983, abandoned. This application Nov. 28, 1984, Ser. No. 676,209

Claims priority, application Japan, May 26, 1982, 57-89360

Int. Cl.[4] C08F *8/32, 2/54;* **C08D** *5/20*

U.S. Cl. 525—380 **16 Claims**

1. A uranium adsorbing material made of a graft polymer with a graft ratio of 20 to 100% which contains amidoxime groups and cation exchange groups in a molar ratio of 1:1 to 3:1.

4,622,367

X-RAY CONTRAST SPHERICAL HYDROGEL PARTICLES BASED ON POLYMER AND COPOLYMERS OF ACRYLATES AND METHACRYLATES AND THE METHOD FOR PREPARATION THEREOF

Daniel Horák; Marie Metalová, both of Prague; Frantisek Svec, Hrebec; Jaroslav Drobník; Jaroslav Kálal, both of Prague, all of Czechoslovakia; Michail I. Kuzin, Moscow, U.S.S.R.; Arnold A. Adamian, Moscow, U.S.S.R.; Jurij V. Moiseiev, Moscow, U.S.S.R., and Klara Z. Gumargalieva, Moscow, U.S.S.R., assignors to Ceskoslovenska akademie ved, Czechoslovakia

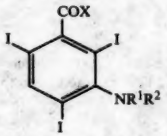
Filed Dec. 10, 1985, Ser. No. 807,281

Claims priority, application Czechoslovakia, Dec. 12, 1984, 9654-84

Int. Cl.[4] C08F *8/32*

U.S. Cl. 525—381 2 Claims

1. X-ray contrast spherical hydrogel particles based on polymers and copolymers of acrylates and methacrylates, wherein particles have the form of spheres with diameter 0.2 to 2 mm, strongly swell in water, and contain a derivative of amino-triiodobenzoic acid of general formula I,



I

where R^1 and R^2 is hydrogen, acyl group with 1 to 3 carbon atoms, or alkyl with 1 to 10 carbon atoms and X is halogen, —OH or $—NH(CH_2)_nNH_2$, where n = 1–6, covalently bonded to the polymer skeleton.

4,622,368

PLASTICIZED POLYETHERIMIDE BLENDS

John W. Verbicky, Jr., Scotia, and Elbridge A. O'Neil, Port Henry, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

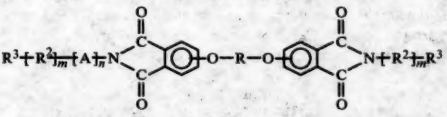
Filed May 13, 1985, Ser. No. 733,433

Int. Cl.[4] C08F *283/04;* C08L *77/00*

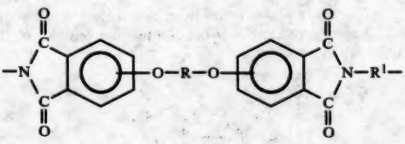
U.S. Cl. 525—426 34 Claims

1. A method for plasticizing polyetherimide resin comprising:

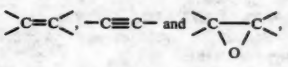
(a) adding to said polyetherimide resin an N-unsaturated alkyl bisimide of the formula,



wherein n is a number having a value of from 0–3, m is equal to 0 or 1, R is a divalent aromatic radical of from 6–30 carbon atoms, A is of the formula



where R is as defined above and R^1 is a divalent organic radical selected from the group consisting of the aromatic radicals defined by R, alkylene radicals of from 1–20 carbon atoms, cycloalkylene radicals of from 4–20 carbon atoms and alkylene terminated polydiorganosiloxane radicals having from 2–8 carbon atoms, R^2 is a divalent organic radical selected from the group consisting of alkylene radicals of from 1–18 carbon atoms, cycloalkylene radicals of from 4–18 carbon atoms and aromatic radicals of from 6–18 carbon atoms, R^3 is an alkyl radical of from 2–20 carbon atoms having an unsaturated functional group selected from the group of the formulas consisting of



and

(b) heating the components of step (a) with mixing until molten.

4,622,369

URETHANE RESINS CONTAINING HYDROLYZABLE MOIETIES FROM ORGANOSILANE COMPOUNDS

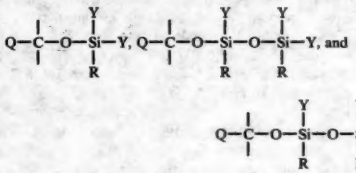
Wen H. Chang; David T. McKeough, both of Gibsonia, and Ronald R. Ambrose, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 30, 1985, Ser. No. 728,967

Int. Cl.[4] C08F *20/00*

U.S. Cl. 525—440 29 Claims

1. An ungelled urethane resin composition comprising a urethane compound having at least one group containing a silicon atom said group selected from:



wherein

Q represents the residue from a urethane polyol, and each

R independently is selected from the group of moieties consisting of hydrogen and a C_1–C_{10} group joined to Si through an Si—C linkage, and

Y represents an easily hydrolyzable group;

provided that said urethane resin composition contains an amount of easily hydrolyzable Y moieties such that the ratio of the number of grams of said ungelled urethane resin composition to equivalents of easily hydrolyzable Y moieties in said ungelled urethane resin composition is in a range of from 40 to 667.

4,622,370

AQUEOUS DRILLING FLUIDS CONTAINING FLUID LOSS ADDITIVES

Dinshaw F. Bardoliwalla, Randolph, and José L. Villa, Bridgewater, both of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed May 1, 1984, Ser. No. 605,933

Int. Cl.[4] C08F *220/04, 220/06*

U.S. Cl. 526—75 6 Claims

1. A copolymer of (1) from about 80% to about 98% by weight of acrylic acid and (2) from about 2% to about 20% by weight of itaconic acid, said copolymer having a weight average molecular weight of between about 100,000 to about 1,000,000, being in the form of its free acid or partially or completely sodium, potassium or ammonium neutralized salt and being at least water dispersible, said partially neutralized

salt being prepared by reacting carboxylic groups present in said acrylic acid and said itaconic acid with neutralizing agent, said copolymer being useful as a fluid loss control additive for aqueous drilling fluids.

4,622,371

OLEFIN POLYMERIZATION

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 4, 1985, Ser. No. 688,928
Int. Cl.[4] C08F *4/02, 10/00*
U.S. Cl. 526—117 **24 Claims**

1. A process for producing high density and high flexural modulus olfin polymers comprising polymerizing said olefins in the presence of a catalyst composition comprising a chromium compound on a xerogel base comprising at least one of iron phosphate and iron polyphosphate and at least one of aluminum phosphate and aluminum polyphosphate.

4,622,372

POLYMER LIFE ENHANCEMENT IN OXYANION-CATALYZED POLYMERIZATION

Ira B. Dicker, Wilmington, Del.; Clyde S. Hutchins, Arlington, Tenn., and Harry J. Spinelli, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 707,194, Mar. 1, 1985, abandoned. This application Feb. 20, 1986, Ser. No. 831,418
Int. Cl.[4] C08F *5/58*
U.S. Cl. 526—190 **12 Claims**

1. Process of preparing a "living" polymer comprising contacting under polymerization conditions at least one polar acrylic-type alpha olefinic monomer with (i) a tetracoordinate organosilicon, organotin, or organogermanium polymerization initiator having at least one initiating site, (ii) a catalyst which is a salt comprising an oxyanion whose conjugate acid has a pKa (DMSO) of about 5 to about 24, and a suitable cation, characterized by also contacting with (iii) a polymerization life enhancement agent which enhances the duration of "livingness" of the polymerization by increasing the proportion of polymerization events to termination events.

4,622,373

FLUID LOSS CONTROL ADDITIVES FROM AMPS POLYMERS

Dinshaw F. Bardoliwalla, Randolph, N.J., assignor to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed May 10, 1984, Ser. No. 608,864
Int. Cl.[4] C08F *228/02*
U.S. Cl. 526—240 **7 Claims**

1. A polymer of (1) from about 18% to about 38% by weight of 2-acrylamido-2-methylpropane sulfonic acid, (2) from about 54% to about 76% by weight of acrylic acid and (3) from about 5% by weight to about 10% by weight of itaconic acid, said polymer having a weight average molecular weight of between about 50,000 to about 1,000,000, being in its free acid or partially or completely neutralized form and being at least water dispersible.

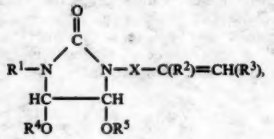
4,622,374

IMIDAZOLIDINONE POLYMERS USEFUL AS NONWOVEN BINDERS

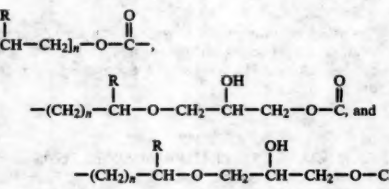
Carmine P. Iovine, Bridgewater; Joseph G. Palmer, Rocky Hill, and James L. Walker, Whitehouse Station, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 682,650, Dec. 17, 1984, Pat. No. 4,596,850, which is a division of Ser. No. 715,218, Mar. 22, 1985, Pat. No. 4,577,031, which is a continuation of Ser. No. 473,922, Mar. 10, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 787,237
Int. Cl.[4] C08F *226/06*
U.S. Cl. 526—263 **20 Claims**

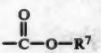
1. A polymer comprising an ethylenically unsaturated monomer and an imidazolidinone monomer having the sturcture:



wherein R^1 is hydrogen or a linear or branched C_1–C_6 alkyl group; X is a divalent radical selected from the group consisting of $-(CH_2)_m-$,



with R being hydrogen or a methyl group, m being an integer from 0–5, and a n being an integer from 1–5; R^2 is hydrogen or a methyl group; R^3 is hydrogen or a



group, with R^7 being hydrogen or a linear or branched C_1–C_6 alkyl or hydroxyalkyl group; and R^4 and R^5 are independently hydrogen or a C_1–C_4 linear or branched alkyl group.

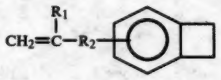
4,622,375

AMORPHOUS ETHYLENE/PROPYLENE POLYMERS

Pui K. Wong, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 28, 1986, Ser. No. 846,315
Int. Cl.[4] C08F *12/32*
U.S. Cl. 526—284 **11 Claims**

1. A solid substantially amorphous copolymer of ethylene, propylene and an olefinic benzocyclobutene monomer of the formula:



where R_1 is hydrogen or CH_3 and R_2 is $-CH_2-_n$ where n is 0 to 6.

4,622,376

COMPOSITION OF AROMATIC POLY(ALLYLCARBONATE), STYRENE MATERIALS, AND CROSSLINKER CONTAINING THREE OR MORE ETHYLENICALLY UNSATURATED GROUPS FOR PRODUCING POLYMER OF HIGH REFRACTIVE INDEX AND LOW YELLOWNESS

Michael S. Misura, Barberton; Richard A. Schwarz, Akron, and Stephanie J. Oates, Canal Fulton, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 27, 1985, Ser. No. 749,602
Int. Cl.[4] C08F *18/24, 212/30*
U.S. Cl. 526—286 **26 Claims**

1. A pourable, polymerizable composition comprising:

(a) aromatic-containing poly(allyl carbonate)-functional material comprising aromatic-containing bis(allyl carbonate)-functional monomer, aromatic-containing poly(allyl carbonate)-functional polymer, or a mixture thereof,

(b) styrenic material, and

(c) polyethylenic-functional monomer containing three or more ethylenically unsaturated groups selected from allyl, methallyl, acrylyl, and methacrylyl, wherein the weight ratio of said polyethylenic-functional monomer to all ethylenically unsaturated material present in said composition is in the range of from about 0.5:100 to about 25:100.

4,622,377

PLASTIC TRANSPARENCY AND METHOD FOR MAKING IT

Marlowe V. Moncur, Irvine, Calif., assignor to Swedlow, Inc., Garden Grove, Calif.

Continuation of Ser. No. 652,861, Sep. 20, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 821,123
Int. Cl.[4] C08F *20/20*
U.S. Cl. 526—323.2 **26 Claims**

1. A transparent sheet consisting essentially of the polymerization product of at least 97.5 mole percent of monofunctional vinyl monomer, of which at least 70 percent is methyl methacrylate, and 0.4 to 2.5 mole percent neopentylene glycol dimethacrylate, wherein the sheet is biaxially stretched to improve its physical strength.

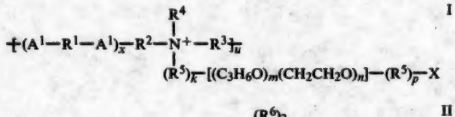
4,622,378

ZWITTERIONIC POLYMERS HAVING CLAY SOIL REMOVAL/ANTI-REDEPOSITION PROPERTIES USEFUL IN DETERGENT COMPOSITIONS

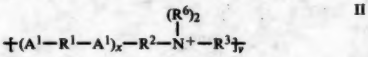
Eugene P. Gosselink, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 452,650, Dec. 23, 1982, abandoned. This application Feb. 15, 1985, Ser. No. 701,883
Int. Cl.[4] C08G *18/12, 18/06*
U.S. Cl. 528—66 **11 Claims**

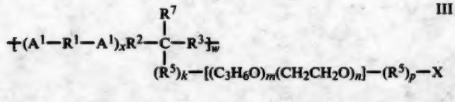
1. A water-soluble zwitterionic polyurethane having clay soil removal and/or anti-redeposition properties, which comprises units having the formulas I, II and III:



I

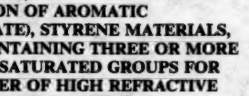


II

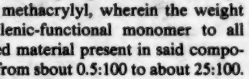


III

-continued



R is H or C_1–C_4 alkyl or hydroxyalkyl; R^1 is C_2–C_{12} alkylene, hydroxyalkylene, alkenylene, cycloalkylene, arylene or alkarylene, or a C_2–C_3 oxyalkylene moiety having from 2 to about 70 oxyalkylene units provided no O—O or N—O bonds are formed with A^1; x is 1; R^2 is $—(OR^8)_y—$ or $—OR^5—$ provided that no O—O or N—O bonds are formed with A^1; R^3 is $—(R^8O)_y—$ or $—R^5O—$ provided that no O—O or O—N bonds are formed with A^1; R^4 is C_1–C_4 alkyl or hydroxyalkyl, $—(R^8O)_q—R^9$, or the moiety $—(R^5)_k[(C_3H_6O)_m(CH_2CH_2O)_n](R^5)_p-X$; R^5 is C_1–C_{12} alkylene, hydroxyalkylene, alkenylene, arylene, or alkarylene; each R^6 is C_1–C_4 alkyl or hydroxyalkyl, $—(R^8O)_q—R^9$, or together form the moiety $—(CH_2)_r—A^2—(CH_2)_s—$, wherein A^2 is —O— or $—CH_2—$; R^7 is H or R^4; R^8 is C_2–C_3 alkylene or hydroxyalkylene; R^9 is



or a mixture thereof; X is SO_3^-, OSO_3^{31} or CO_2^-; k is 0 or 1; m is from 0 to about 5; n is at least about 12; m and n are numbers such that the moiety $—(CH_2CH_2O)_n—$ comprises at least about 85% by weight of the moiety $—[(C_3H_6O)_m(CH_2CH_2O)_n]—$; p is 1, or 0 only when X is SO_3^-; q is from 1 to about 100; r is 1 or 2, s is 1 or 2, and r+s is 3 or 4; y is from 2 to about 20; the number of u, v and w is such that there are at least 2N+ centers and at least 2 X groups, provided that when the polyurethane comprises units of Formula II and III, said units of Formulas II and III are together.

4,622,379

POLYESTERCARBONATE FROM AMIDE SUBSTITUTED AROMATIC DICARBOXYLIC ACID

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Oct. 5, 1984, Ser. No. 657,897
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—176 **10 Claims**

1. A composition comprising an aromatic copolyestercarbonate having an improving effective amount of ester units of the structure

FIG. 1

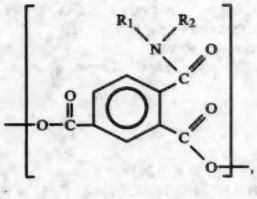
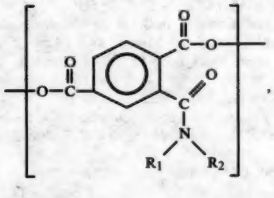


FIG. 2



, or

or mixtures of the above two structures wherein R_1 and R_2 are

the same or different and are alkyl of one to six carbon atoms, inclusive, cycloalkyl of four to seven carbon atoms, inclusive, phenyl, one to three alkyl substituted phenyl each alkyl having one to three carbon atoms, inclusive, or R_1 and R_2 taken together with the nitrogen to which they are attached form a ring of four to six carbon atoms, inclusive, or carbazole.

4,622,380

ALKYLIDENE BROMO-SUBSTITUTED ARYLENE ACETAL AND/OR KETAL POLYMERS

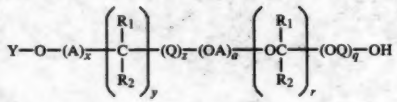
Nicodemus E. Boyer, Schaumburg, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 20, 1985, Ser. No. 746,805

Int. Cl.[4] C08G 65/38

U.S. Cl. 528—219 **22 Claims**

1. Acetal and/or ketal polymer diagrammatically represented by the formula:



wherein

a. each A is individually a divalent aromatic group containing either one aromatic ring substituted by at least two bromo groups or two aromatic rings which are either joined together or separated by an atom, each of said rings being substituted by at least two bromo groups,

b. each R_1 is individually hydrogen, unsubstituted alkyl, substituted alkyl, unsubstituted phenyl, or substituted phenyl,

c. each R_2 is individually hydrogen, unsubstituted alkyl, substituted alkyl, unsubstituted phenyl, or substituted phenyl,

d. each Q is individually a divalent orango group other than A having at least two carbon atoms between the two valences thereof,

e. Y of each molecule of said polymer is or a bromo substituted monovalent organo group,

f. the average value of each x, y and z is in the range of from 0 to 1,

g. the sum of the average values of a and x is in the range of from 2 to about 30,

h. the sum of the average values of r and y is in the range of from 1 to about 30,

i. the sum of the average values of q and z is in the range of from 0 to about 5,

provided that

j. the sum of the average values of x, y and z is 1,

k. the sum of the average values of a and x is greater than the sum of the average values of r and y, and

l. the sum of the average values of a and x is greater than or equal to the sum of the average values of q and z.

4,622,381

MODIFIED POLYESTER FIBER AND PROCESS FOR PREPARATION THEREOF

Togi Suzuki; Tadashi Konishi, both of Matsuyama; Kohichi Iohara, Suita; Shinji Ohwaki, Minoo, and Setsuo Yamada, Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan

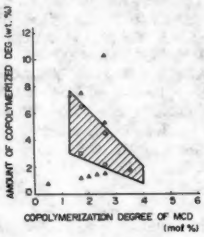
Filed Oct. 2, 1985, Ser. No. 783,197

Claims priority, application Japan, Oct. 3, 1984, 59-206369; Mar. 25, 1985, 60-58559; Apr. 17, 1985, 60-80273; Jun. 13, 1985, 60-127108

Int. Cl.[4] C08G 63/68, 75/00

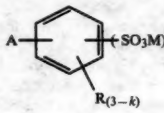
U.S. Cl. 528—295 **17 Claims**

1. A fiber composed of a polyester having at least a part of the terminals thereof blocked with the residue of at least one

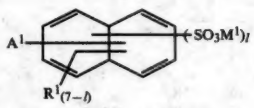


compound selected from sulfonic acid salt compounds represented by the following general formulae (I), (II) and (III):

(I)

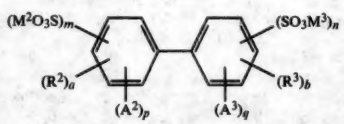


(II)



and

(III)

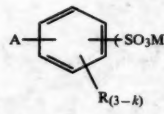


wherein A, A^1, A^2 and A^3 stand for an esterforming functional group, R, R^1, R^2 and R, R^1, R^2 and R^3 stand for a hydrogen atom, a hydroxyl group, an alkyl group or a halogen atom, M, M^1, M^2 and M^3 stand for a metal, each of k and l is 1 or 2, m and n are integers of from 0 to 2 satisfying the relation of $1 \leqq m+n \leqq 4$, p and q are integers of from 0 to 1 satisfying the relation of $p+q=1$, and a and b are positive integers satisfying the relations of $m+a+p=5$ and $n+b+q=5$,

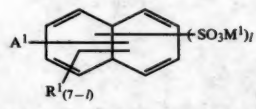
wherein the amount of the blocked terminals is 1.3 to 4.0 mol % based on the total acid component of the polyester and the alkali dissolution speed constant is 3.3×10^{-9} to 6.5×10^{-9} cm/sec.

14. A process for the preparation of a polyester fiber, which comprises melt-spinning a polyester having at least a part of the terminals thereof blocked with the residue of at least one compound selected from sulfonic acid salt compounds represented by the following general formulae (I), (II) and (III):

(I)

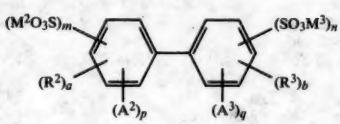


(II)



and

-continued



(III)

wherein A, A^1, A^2 and A^3 stand for an esterforming functional group, R, R^1, R^2 and R^3 stand for a hydrogen atom, a hydroxyl group, an alkyl group or a halogen atom, M, M^1, M^2 and M^3 stand for a metal, each of k and l is 1 or 2, m and n are integers of from 0 to 2 satisfying the relation of $1 \leqq m+n \leqq 4$, p and q are integers of from 0 to 1 satisfying the relation of $p+q=1$, and a and b are positive integers satisfying the relations of $m+a+p=5$ and $n+b+q=5$,

wherein the amount of the blocked terminals is 1.3 to 4.0 mol % based on the total acid component of the polyester and the alkali dissolution speed constant is 3.3×10^{-9} to 6.5×10^{-9} cm/sec.

4,622,382

UNSATURATED ALCOHOL-MODIFIED POLYESTERS

Herbert Fischer, Duesseldorf; Bernd Wegemund, Haan; Manfred Gorzinski, Duesseldorf, and Wolfgang Gress, Wuppertal-Elberfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 9, 1985, Ser. No. 753,194

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1984, 3425183

Int. Cl.[4] C08G *63/54*

U.S. Cl. 528—295.3 **33 Claims**

1. An unsaturated polyester consisting essentially of:

a central portion consisting essentially of the esterification residue of a polyol having from an average of more than 2 up to 25 polyol hydroxy moieties;

an esterification residue of at least one di- or tri- carboxylic acid which has an esterification link to at least 70% of said polyol hydroxy moieties through one of said acid's carboxylic moieties; and

an esterification residue of at least one monohydric, olefinically unsaturated, C_{12-22} alcohol which has an esterification link to at least 80% of the remaining carboxylic acid moieties of said acid residue through its sole hydroxy moiety.

4,622,383

METHOD FOR THE FRACTIONATION OF REACTIVE TERMINATED POLYMERIZABLE OLIGOMERS

Constance J. Araps, Wappingers Falls; Steven M. Kandetzke, Fishkill, and Mark A. Takacs, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 556,731, Nov. 30, 1983, abandoned, and a continuation-in-part of Ser. No. 556,734, Nov. 30, 1983, abandoned. This application Jul. 26, 1985, Ser. No. 759,630

Int. Cl.[4] C08G *69/26, 69/34*

U.S. Cl. 528—345 **10 Claims**

1. A method for fractionating a polyamic acid polymerizable oligomer to obtain an oligomeric product having a molecular weight in the range of about 2,000 to about 4,000, wherein the end groups of the polyamic acid polymerizable oligomer are end capped with a vinyl or acetylinic end group, the process comprising:

(a) dissolving the polymerizable oligomer to be fractionated in a solvent in which the desired molecular weight fraction is soluble to prepare an oligomer solution,

(b) passing the oligomer solution through a filter which removes undissolved material having a molecular weight in excess of the desired molecular weight range,

(c) collecting an oligomer filtrate and admixing the filtrate with an hydrocarbon to precipitate the desired molecular weight fraction and then

(d) collecting the precipitate of desired molecular weight fraction.

4,622,384

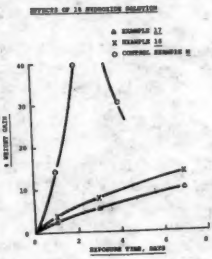
POLYIMIDE MOLDING RESINS AND MOLDED ARTICLES

Carl H. Manwiller, Christiana, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

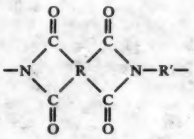
Filed Apr. 26, 1985, Ser. No. 727,811

Int. Cl.[4] C08G *69/26*

U.S. Cl. 528—353 **11 Claims**



1. In a solid particulate polyimide, the polyimide having the recurring unit



wherein R is a tetravalent radical containing at least one 6-carbon atom ring characterized by benzenoid unsaturation and wherein the four carbonyl groups are attached directly to different carbon atoms in the radical and wherein each pair of carbonyl groups is attached to adjacent carbon atoms in a 6-membered benzenoid ring of the radical and wherein R′ is a divalent radical containing at least one six-carbon atom ring, each ring characterized by benzenoid unsaturation, and when at least two rings are present in R′, no more than one of the valence bonds is located on any one of the rings, said particles having a surface area of greater than 20 square meters per gram, the improvement wherein the polyimide exhibits a Crystallinity Index of less than about 15, as measured by X-ray diffraction.

6. In a process for the preparation of a solid particulate polyimide by the reaction of (1) at least one organic diamine of the formula $H_2N—R'—NH_2$, wherein R′ is a divalent radical containing at least one six-carbon atom ring, each ring characterized by benzenoid unsaturation, and, when at least two rings are present in R′, no more than one valence bond is located on any one of said rings, and (2) at least one tetracarboxylic acid dianhydride and converting the resulting product to polyimide, the improvement which comprises:

(a) reacting the diamine and the dianhydride in a solvent having a pH of about from 8.0 to 10.0;

(b) maintaining the concentration of the solution resulting from the reaction of the tetracarboxylic acid dianhydride and the organic diamine at about from 1 to 15% polymer;

(c) bringing the polymer solution into contact with a nonsol-

vent for the resulting polymer at a temperature of about from 0° to 65° C.;

(d) maintaining the ratio of the nonsolvent and original polymer solvent such that the combined solvent and nonsolvent contains no more than about 70% solvent; and

(e) agitating the mixture of polymer solution and nonsolvent to bring the nonsolvent and the solution into intimate contact so as to provide a surface area in the polyimide resin of greater than about 20 square meters per gram.

4,622,385

METHOD OF PRODUCING POLYACETAL POLYMER SHOWING IMPROVED HEAT RESISTANCE AND MOLDABILITY

Takeshi Asano; Tsuneyoshi Okada, and Hiroshi Nakatsuji, all of Fuji, Japan, assignors to Polyplastics Company, Ltd., Osaka, Japan

Filed Sep. 11, 1984, Ser. No. 649,450
Claims priority, application Japan, Sep. 16, 1983, 58-170989
Int. Cl.⁴ C08G *2/28*
U.S. Cl. 528—491 **13 Claims**

1. A method of treating a polyacetal polymer comprising the steps of:

melting crude polyacetal polymer having a main chain containing bonded oxymethylene groups; and

heating 100 parts by weight of said polyacetal polymer to a temperature of at least 80° C. in at least 100 parts by weight of a liquid medium into which said polyacetal polymer is insoluble and maintaining said polyacetal polymer and liquid medium a a heterogeneous system.

4,622,386

[1,7-DI-ALANINE]CALCITONIN

Ronald C. Orlowski, Frankfort; Jay K. Seyler, Bourbonnais, both of Ill., and Glenn L. Stahl, Manchester, Mo., assignors to Armour Pharmaceutical Company, Ft. Washington, Pa.

Filed Mar. 28, 1985, Ser. No. 717,045
Int. Cl.⁴ C07K *7/36*
U.S. Cl. 530—307 **2 Claims**

1. A peptide having the structure:

Ala—Ser—Asn—Leu—Ser—Thr—Ala—Val—Leu—Gly—Lys—
Leu—Ser—Gln—Glu—Ala—His—Lys—Leu—Gln—Thr—Tyr—
Pro—Arg—Thr—Asn—Thr—Gly—Ser—Gly—Thr—Pro—NH_2.

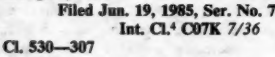
4,622,387

8-METHIONINE CALCITONIN

Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Co., Ft. Washington, Pa.

Filed Jun. 19, 1985, Ser. No. 746,435
Int. Cl.⁴ C07K *7/36*
U.S. Cl. 530—307 **3 Claims**

1. A peptide having the structure:



Cys—Ser—Asn—Leu—Ser—Thr—Cys—Met—Leu—

—Gly—Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—
—Leu—Gln—Thr—Tyr—Pro—Arg—Thr—Asn—Thr—
—Gly—Ser—Gly—Thr—Pro—NH_2.

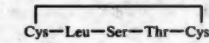
4,622,388

DES-2-SERINE, 3 ASPARAGINE-CALCITONIN

Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Company, Fort Washington, Pa.

Filed Nov. 12, 1985, Ser. No. 797,074
Int. Cl.⁴ C07K *7/36*
U.S. Cl. 530—307 **5 Claims**

1. A peptide having the structure:



Cys—Leu—Ser—Thr—Cys—Val—Leu—Gly—Lys—

—Leu—Ser—Gln—Glu—Leu—His—Lys—Leu—Gln—
—Thr—Tyr—Pro—Arg—Thr—Asn—Thr—Gly—Ser—
—Gly—Thr—Pro—NH_2.

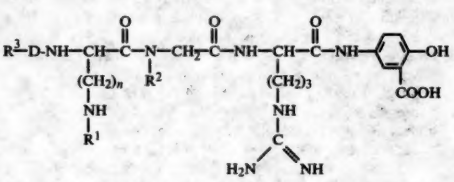
4,622,389

NOVEL SUBSTRATE FOR DETERMINING THE ACTIVITY OF BLOOD COAGULATION FACTOR XA (STUART-PROWER FACTOR)

Takeshi Nagasawa, Urawa; Yoshio Nakamura, Koriyama; Tsuyoshi Enomoto, Koriyama, and Katsumasa Kuroiwa, Koriyama, all of Japan, assignors to Nitto Poseki Co., Ltd., Fukushima, Japan

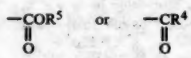
Filed May 9, 1985, Ser. No. 732,396
Claims priority, application Japan, May 16, 1984, 59-98355
Int. Cl.⁴ C07K *5/08*; C12Q *1/56*
U.S. Cl. 530—331 **1 Claim**

1. A novel substrate for determining the activity of blood coagulation factor Xa (Stuart-Prower factor), said substrate having the property of developing color or becoming fluorescent when combined with said factor Xa or factor Xa-like enzymes, said substrate being composed of a compound represented by the general formula:



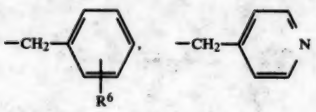
[wherein n is an integer of 3–4; R^1 is a hydrogen atom or a group of the formula

R^2 is a hydrogen atom, a methyl group or a phenyl group; R^3 is a group of the formula



(wherein R^4 is a hydrogen atom, a methyl group, a phenyl group or a group of the formula

and R^5 is a group of the formula



or —C(CH$_3$)$_3$, wherein R^6 is a hydrogen atom or a methoxy group)], characterized in that said compound contains 3-carboxy-4-hydroxyanilide (CHA) group in its molecule as the chromogenic group.

4,622,390

WATER-SOLUBLE DISAZO COMPOUNDS CONTAINING AN AMINO NAPHTHOL-DISULFONIC ACID MOIETY AS A COUPLING COMPONENT AND FIBRE-REACTIVE GROUPS

Fritz Meininger; Ernst Hoyer, both of Frankfurt am Main; Joachim W. Otten, deceased, late of Offenbach am Main; by Ursula Otten, heir, Heidelberg; by Anna G. Rudolph née Otten, heir, Dillenburg, and Rudolf Fass, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

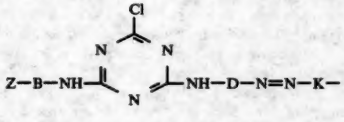
Continuation of Ser. No. 299,342, Sep. 4, 1981, abandoned. This application Sep. 9, 1985, Ser. No. 774,171

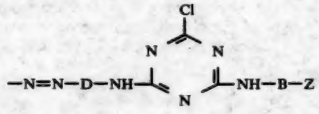
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 3033611

Int. Cl.[4] **C09B** *62/09, 62/453, 62/533;* **D06P** *1/382*

U.S. Cl. 534—634 **13 Claims**

1. A water-soluble disazo compound of the formula





in which

Z is vinylsulfonyl or β-sulfatoethylsulfonyl, and the two formula moieties Z are identical to each other or are different from one another,

B is phenylene unsubstituted or substituted by one sulfo or by one methyl or by one methoxy or by one chlorine or by two methoxy or by one methoxy and one methyl, and the two formula moieties B are identical to each other or different from one another,

D is phenylene unsubstituted or substituted by one or two sulfo or by one methoxy or by one methyl or by one chlorine or by two methoxy or by one methoxy and one methyl, and the two formula moieties D are identical to each other or different from one another, and

K is 1-amino-8-hydroxy-3,6-disulfo-naphth-2,7-ylene or 1-amino-8-hydroxy-4,6-disulfo-naphth-2,7-ylene, or an alkali metal salt thereof.

4,622,391

INCLUSION COMPOUNDS, INTERCALATION COMPOUNDS, AND SOLID SOLUTIONS OF COLORED ORGANIC METAL COMPOUNDS WHICH CONTAINS A NICKEL SALT OR NICKEL COMPLEX OF AN AZOBARBITURIC ACID OR ITS TAUTOMER

Manfred Lorenz, Cologne, and Karl H. Schündehütte, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

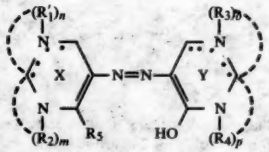
Continuation of Ser. No. 667,526, Nov. 2, 1984, abandoned, which is a continuation of Ser. No. 602,845, Apr. 23, 1984, abandoned, which is a continuation of Ser. No. 408,345, Aug. 16, 1982, abandoned. This application May 15, 1985, Ser. No. 734,377

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134725; Apr. 29, 1982, 3215876

Int. Cl.[4] **C09B** *27/00, 29/036, 29/52, 45/14, 45/22;* **C06P** *1/04, 1/10, 1/50*

U.S. Cl. 534—707 **20 Claims**

1. An inclusion compound, intercalation compound or solid solution which is a nickel salt or nickel complex, of a compound which, in one of its tauteromeric structures, corresponds to the formula



in which the rings designated

X and Y are unsubstituted or are substituted by one or two substituents from the group consisting of =O, =S, =NR$_7$, —NR$_6$R$_7$, —OR$_6$, —SR$_6$, —COOR$_6$, —CN, —CONR$_6$R$_7$, —SO$_2$R$_8$,

alkyl, cycloalkyl, aryl and aralkyl,

the total number of the endocyclic and exocyclic double bonds for each of the rings X and Y being three,

R$_6$ represents hydrogen, alkyl, cycloalkyl, aryl or aralkyl and

R$_7$ represents hydrogen, cyano, alkyl, cycloalkyl, aryl, aralkyl, C$_1$–C$_6$-alkyl-carbonyl, phenylcarbonyl, C$_1$–C$_6$-alkyl-sulphonyl, phenylsulphonyl, carbamoyl, carbamoyl which is substituted by C$_1$–C$_6$-alkyl, phenyl or napthyl, sulphamoyl, sulphamoyl substituted by C$_1$–C$_6$-alkyl, phenyl or napthyl, guanyl, guanyl substituted by Chd 1–C$_6$-alkyl, phenyl or naphthyl,

wherein the alkyl radicals mentioned are substituted or are unsubstituted by radicals selected from halogen, —OH, —CN, —NH$_2$ or C$_1$–C$_6$-alkoxy and the phenyl and naphthyl radicals mentioned are unsubstituted or are substituted by radicals selected from halogen, —OH, C$_1$–C$_6$-alkyl, C$_1$–C$_6$-alkoxy, —NH$_2$, —NO$_2$ or —CN, and

R$_8$ designates alkyl, cycloalkyl, aryl or aralkyl,

R$_1$, R$_2$, R$_3$ and R$_4$ represent hydrogen, alkyl, cycloalkyl, aryl or aralkyl or, as indicated by the broken lines in the formula, form a triazole, imidazole, benzimidazole, pyrimidine or quinazoline ring or a triazole, imidazole, benzimidazole, pyrimidine or quinazoline ring to which further rings are fused,

R$_5$ designates —OH, —NR$_6$R$_7$, alkyl, cycloalkyl, aryl, or aralkyl, and

m, n, o and p each are 1, or in the case where double bonds extend from the ring nitrogen atoms, as indicated by the dotted lines in the formula, each are 0 or 1 containing at

least one other included compound, except for one composition of matter which consists of 45 to 82% by weight of azobarbituric acid/nickel 1:1 complex, 3 to 15% by weight of benzene-sulphonamide, 5 to 20% by weight of nickel acetate and 10 to 20% by weight of water.

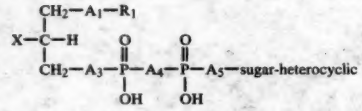
4,622,392

THIOPHOSPHOLIPID CONJUGATES OF ANTITUMOR AGENTS

Chung I. Hong, Williamsville, and Charles R. West, Amherst, both of N.Y., assignors to Health Research Inc. (Roswell Park Division), Buffalo, N.Y.

Filed Jun. 21, 1984, Ser. No. 623,002
Int. Cl.[4] C07H *15/12, 17/00*
U.S. Cl. 536—29 **4 Claims**

1. A compound selected from the group of compounds having the formula



wherein:

R_1 is selected from the group consisting of alkyl and alkenyl containing from about 8 to about 22 carbon atoms;

A_1 is S;

A_3, A_4 and A_5 are each 0; and

X is fatty acyl containing from about 8 to about 22 carbon atoms;

sugar is arabinose, esterified to the phosphate moiety at the 5′-position and covalently bonded to the heterocyclic moiety at the 1′-position to form a nucleoside;

heterocyclic is cytosime and

physiologically acceptable salts thereof.

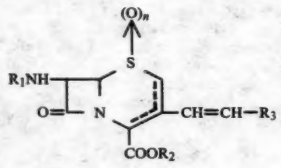
4,622,393

3-VINYL-CEPHALOSPORINS AND THEIR PREPARATIONS

Daniel Farge; Pierre Le Roy, both of Thiais; Claude Moutonnier, Le Plessis Robinson, and Jean-Francois Peyronel, Palaiseau, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 322,931, Nov. 19, 1981, abandoned. This application May 14, 1984, Ser. No. 610,175
Claims priority, application France, Nov. 20, 1980, 80 24635
Int. Cl.[4] C07D *501/24*
U.S. Cl. 540—215 **11 Claims**

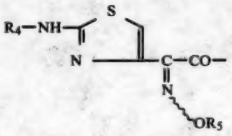
1. A 3-vinylcephalosporin of the formula:



(I)

in which n is equal to 0 or 1,

1. (a) the symbol R_1 represents a hydrogen atom, a radical of the formula:



(II)

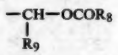
in the syn or anti form, (in which formula R_4 is a hydrogen atom or an amine-protecting radical and R_5 is a hydrogen atom, an alkyl, vinyl or cyanomethyl radical or an oxime-protecting group), an acyl radical of the formula:

R_6CO—

in which R_6 is a hydrogen atom, an alkyl radical (optionally substituted by one or more halogen atoms or by a phenyl or phenoxy radical) or a phenyl radical, a radical of the formula:

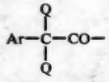
R_7OCO—

in which R_7 is an unsubstituted branched alkyl radical or a linear or branched alkyl radical carrying one or more substituents (chosen from amongst halogen atoms, cyano, trialkylsilyl and phenyl radicals and the phenyl radical substituted by one or more alkoxy, nitro or phenyl radicals) or a vinyl, allyl or quinolyl radical, or a nitrophenylthio radical, or alternatively R_1NH— is replaced by a methyleneamino radical in which the methylene radical is substituted by a dialkylamino group or a phenyl group (which is itself optionally substituted by one or more methoxy or nitro radicals), and the symbol R_2 represents a hydrogen atom, a radical which can easily be removed by an enzymatic method, of the formula:



(in which R_8 represents an alkyl radical or the cyclohexyl radical and R_9 represents a hydrogen atom or an alkyl radical or a methoxymethyl, t-butyl, benzhydryl, nitrobenzyl or p-methoxybenzyl radical), or

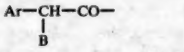
(b) the symbol R_1 represents a hydrogen atom, an alkanoyl radical containing 1 to 8 carbon atoms or an alkanoyl radical containing 2 to 8 carbon atoms, which is substituted (by chlorine or bromine atoms), an azidoacetyl or cyanoacetyl radical, an acyl radical of the formula:



{in which Q is H or methyl and Ar represents a thien-2-yl, thien-3-yl, furan-2-yl, furan-3-yl, pyrrol-2-yl or pyrrol-3-yl radical or a phenyl radical (optionally substituted by halogen atoms, trifluoromethyl or hydroxyl radicals, alkyl radicals (containing 1 to 3 carbon atoms), alkoxy radicals (containing 1 to 3 carbon atoms) or cyano or nitro radicals, at least one of which is located in the meta-position or para-position of the phenyl)}, an acyl radical of the formula:

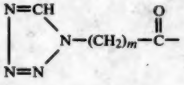
Ar—X—CH_2—CO—

in which X is oxygen or sulphur and Ar is defined as above, or Ar—X— represents pyrid-4-yl-thio, an acyl radical of the formula:



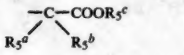
(VIII)

in which Ar is defined as above and B represents an amino radical, an amino radical protected by a benzyloxycarbonyl, alkoxycarbonyl, cyclopentyloxycarbonyl, cyclohexyloxycarbonyl, benzhydryloxycarbonyl, trityl or 2,2,2-trichloroethoxycarbonyl group, a sulpho radical, a hydroxyl or carboxyl radical {optionally protected by esterification (with respectively an alkanoic acid or an alcohol containing 1 to 6 carbon atoms)} or an azido, cyano or carbamoyl radical, a (3-sydnone)-2-alkanoyl radical (the alkanoyl part of which contains 1 to 3 carbon atoms), an acyl radical of the formula:



in which m is 0 to 2, or a 5-aminodipoyl radical {in which the amino group is optionally protected by an alkanoyl radical (containing 1 to 3 carbon atoms and optionally substituted by a chlorine atom) and in which the carboxyl group is protected by a benzhydryl or 2,2,2-trichloroethyl radical, a t-alkyl radical (containing 4 to 6 carbon atoms) or a nitrobenzyl radical}, and the symbol R_2 represents a t-alkyl radical containing 4 to 6 carbon atoms, a t-alkenyl radical containing 6 or 7 carbon atoms, a t-alkynyl radical containing 6 or 7 carbon atoms, a benzyl, methoxybenzyl, nitrobenzyl, 2,2,2-trichloroethyl, benzhydryl, succinimidomethyl or phthalimidomethyl radical or a hydrogen atom, and the symbol R_3 represents a chlorine, bromine or iodine atom or

2. the symbol R_1 represents a radical of the formula (II) in which R_4 is defined as under 1.(a) and R_5 represents a radical of the formula:



(IIa)

(in which R^a_5 and R^b_5, which are identical or different, represent hydrogen atoms or alkyl radicals, or together form an alkylene radical containing 2 or 3 carbon atoms, and R^c_5 represents a hydrogen atom or an acid-protecting radical), the symbol R_2 is defined as above under 1.(a) and the symbol R_3 represents a radical of the formula:

R'_3—SO_2O—

or

R''_3—COO—

(in which formulae R'_3 represents an alkyl, trifluoromethyl or trichloromethyl radical or a phenyl radical which is unsubstituted or substituted by a halogen atom or by an alkyl or nitro radical), and R''_3 is defined in the same way as R'_3 or represents an acylmethyl, 2-acylethyl, 2-acylpropyl, alkoxycarbonylmethyl, 2-alkoxycarbonylethyl or 2-alkoxycarbonylpropyl radical, or R_3 represents a chlorine, bromine or iodine atom, the above-mentioned alkyl or acyl portions or radicals being linear or branched (unless otherwise mentioned) and containing 1 to 4 carbon atoms, the product being in the form of a bicyclooct-2-ene or bicyclooct-3-ene if n=0, and in the form of a bicyclooct-2-ene if n=1, and the substituent in the 3-position being in the E or Z form, and also the mixtures of its isomers and its salts.

4,622,394

OXYGEN ANALOGS OF CEPHALOSPORINS

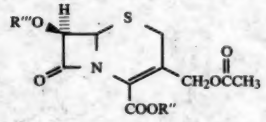
John C. Sheehan, Lexington, and Young S. Lo, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 494,507, Aug. 5, 1974, Pat. No. 4,456,755. This application Dec. 2, 1977, Ser. No. 856,749 The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

Int. Cl.[4] **C07D** *501/00*; **A61K** *31/545*

U.S. Cl. 540—228 **6 Claims**

1. A compound of the formula



wherein:

R'' is hydrogen, methyl, benzyl, phenacyl, β,β,β-trichloroethyl or benzhydryl; and

R''' is hydroxyacetyl, phenoxyacetyl, phenylacetyl, tetrazolylacetyl or 2-thienylacetyl.

4,622,395

PHENOXAZINE AND PHENOTHIAZINE DYES AND LEUCO FORMS THEREOF

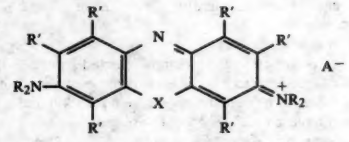
Peter A. Bellus, Minneapolis, and Roger A. Mader, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 1, 1984, Ser. No. 656,460

Int. Cl.[4] **C07D** *265/38, 279/18, 279/24, 279/30*

U.S. Cl. 544—37 **23 Claims**

1. A phenoxazine or phenothiazine dye represented by the formula:



wherein

X is —S— or —O—;

each R is the same or different and is independently selected from

(1) hydrogen,

(2) an unsubstituted aryl or alkyl group or these groups substituted by up to four groups selected from alkyl, alkoxy, cyano, hydroxy, halogen, nitro, mercapto, and Z, where Z is as defined below, wherein all alkyl and alkoxy groups have 1 to 20 carbon atoms, and

(3) Z, wherein Z is

wherein Q is independently selected from

(1) hydrogen,

(2) an unsubstituted aryl or alkyl group or these groups substituted by up to four groups selected from alkyl, alkoxy, cyano, hydroxy, halogen, nitro, mercapto, and Z, where Z is as defined above, wherein all alkyl and alkoxy groups have 1 to 20 carbon atoms; and

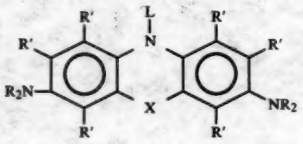
R' is the same or different and is independently selected from (1) hydrogen or halogen, and (2) alkyl or alkoxy of 1 to 6

carbon atoms or these groups substituted by up to 3 halogen atoms; and

A is an anion;

with the proviso that when X=—O—, R cannot be halomethyl or cyanomethyl, and with the proviso that R can have up to a total of 5 carbonyl and sulfonyl groups, and with the proviso that the average value of a Taft Constant and of a Hammett Constant for the two R groups on at least one 3- or 7-position nitrogen atom is greater than 1.5 for a Taft constant and greater than +0.15 for a Hammett Constant; and with the proviso that said dye has a λmax of less than 580 nm.

2. A leuco phenoxazine or phenothiazine dye represented by the formula



wherein

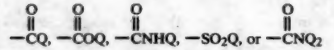
X is —S— or —O—;

each R is the same or different and is independently selected from

(1) hydrogen,

(2) an unsubstituted aryl or alkyl group or these groups substituted by up to four groups selected from alkyl, alkoxy, cyano, hydroxy, halogen, nitro, mecapto, and Z, where Z is as defined below, wherein all aklyl and alkoxy groups have 1 to 20 carbon atoms; and

(3) Z, wherein Z is



wherein Q is independently selected from

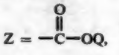
(1) hydrogen,

(2) an unsubstituted aryl or alkyl group or these groups substituted by up to four groups selected from alkyl, alkoxy, cyano, hydroxy, halogen, nitro, mercapto, and Z, where Z is as defined above, wherein all alkyl and alkoxy groups have 1 to 20 carbon atoms; and

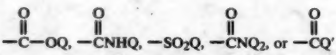
R′ is the same or different and is independently selected from (1) hydrogen or halogen, and (2) alkyl or alkoxy of 1 to 6 carbon atoms or these groups substituted by up to 3 halogen atoms; and

L is Z;

with the proviso that R and L can have up to a total of 5 carbonyl and sulfonyl groups, and with the proviso that when X=S— and



then L is only



wherein each Q can be the same or different and is independently

(1) hydrogen,

(2) an unsubstituted aryl or alkyl group or these groups substituted by up to four groups selected from alkyl, alkoxy, cyano, hydroxy, halogen, nitro, mercapto, and Z, where Z is as defined above in the definition of R, wherein all alkyl and alkoxy groups have 1 to 20 carbon atoms; and wherein Q′ is selected from

(1) hydrogen,

(2) an unsubstituted aryl group or this group substituted by up to four groups selected from alkyl, alkoxy, cyano, hydroxy, halogen, nitro, mercapto, and Z wherein Z is as defined in the definition of R above, wherein all alkyl and alkoxy groups have 1 to 20 carbon atoms,

with the proviso that if only one R is

then L cannot also be the same

with the proviso that when X is —O—, Z cannot be

and with the proviso that the average value of a Taft Constant and of a Hammett Constant for the two R groups on at least one 3- or 7-position nitrogen atom is greater than 1.5 for a Taft Constant and greater than +0.15 for a Hammett Constant, and with the proviso that said leuco dye can be oxidized to a dye having a λmax of less than 580 nm.

4,622,396

TRIPHENDIOXAZINE DYESTUFFS

Wolfgang Harms; Klaus Wunderlich, and Horst Jäger, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

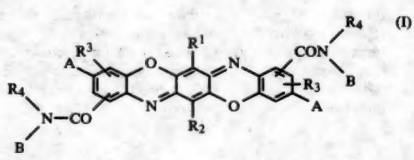
Filed Feb. 22, 1985, Ser. No. 704,441

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409439

Int. Cl.[4] C07D *265/28*

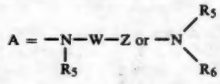
U.S. Cl. 544—76 **12 Claims**

1. A dyestuff of the formula



(I)

in which



wherein

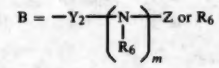
W=direct bond or

wherein

n=0 or 1,

Y_1=C_2–C_6-alkylene optionally interrupted by O, S or N or

substituted by hydroxy or sulphato, phenyl-C_1–C_2-alkylene, optionally substituted by SO_3H or CH_3, phenylene, optionally substituted by alkyl, alkoxy, sulfo, carboxy or halogen; R_5=H; R_6=H, C_1–C_6-alkyl optionally substituted by SO_3H, OSO_3H, COOH, OH, C_1–C_4-alkoxy; C_5–C_6-cycloalkyl, phenyl-C_1–C_4-alkyl; phenyl or naphthyl optionally substituted by SO_3H, COOH, C_1–C_4-alkyl, halogen, C_1–C_4-alkoxy; C_1–C_4-alkylsulfonyl, phenyl-C_1–C_4-alkylsulfonyl, phenylsulfonyl, naphthylsulfonyl, wherein R_5 and R_6 together can also denote a C_4–C_5-alkylene radical which is optionally interrupted by O or N;



wherein

Z=fibre reactive group

Y_2=Y_1 and if n=1, SO_2-phenylene,

R_1 and R_2=H, Cl, Br, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenoxy, carboxy, acylamino,

R_3=H, C_1–C_4-alkyl, C_1–C_4-alkoxy, Cl,

R_4=R_6.

4,622,397

3-CHLORO-AS-TRIAZIN-5-ONES

Beat Böhner, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

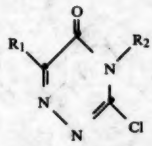
Filed Jul. 5, 1985, Ser. No. 752,288

Claims priority, application Switzerland, Jul. 12, 1984, 3403/84

Int. Cl.⁴ C07D *253/06*

U.S. Cl. 544—182 **3 Claims**

1. A 3-chlorotriazinone derivative of the formula



wherein R_1 and R_2, each independently of the other, are C_1–C_8-alkyl which is unsubstituted or substituted by C_1–C_4-alkoxy or halogen; C_3–C_8-cycloalkyl which is unsubstituted or substituted by methyl; benzyl which is unsubstituted or substituted by one or more members selected from the group consisting of halogen, C_1–C_8-alkyl, C_1–C_4-haloalkyl and C_1–C_4-alkoxy; or are phenyl or naphthyl which is unsubstituted or substituted by one or more members selected from the group consisting of C_1–C_8-alkyl, halogen, C_1–C_4-haloalkyl and C_1–C_4-alkoxy, or a hydrochloride thereof.

4,622,398

DIALKYLAMINOTETRAHYDROQUINAZOLINE

Bennett C. Laguzza, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 24, 1985, Ser. No. 748,116

Int. Cl.⁴ C07D *239/84*

U.S. Cl. 544—292 **9 Claims**

1. A compound of the formula

wherein R is H, OH, C_{1-2}alkyl-CO-O, C_{1-3}alkyl-S or NR^1R^2 wherein R^1 and R^2 are individually H, methyl ethyl and n-propyl and wherein R^3 and R^4 are individually methyl, ethyl, n-propyl or allyl; and pharmaceutically-acceptable, acid addition salts thereof.

4,622,399

BICYCLO-HETEROCYCLIC NITROGEN SUBSTITUTED AMINOETHANOL DERIVATIVES

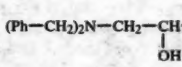
André A. Asselin, St. Laurent; Danilo A. Crosilla, Ile Bizard, and Leslie G. Humber, Dollard-des-Ormeaux, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 648,418, Oct. 23, 1984, Pat. No. 4,562,200, which is a division of Ser. No. 509,888, Jun. 30, 1983, Pat. No. 4,521,606. This application May 23, 1985, Ser. No. 737,297

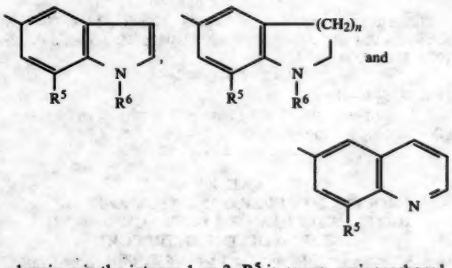
Int. Cl.⁴ C07D *209/08, 215/14*

U.S. Cl. 546—169 **3 Claims**

1. A compound of the formula



in which R^4 is a heterocycle selected from the group consisting of



wherein n is the integer 1 or 2; R^5 is cyano, aminocarbonyl, methylthio, methylsulfinyl, methylsulfonyl or aminosulfonyl; and R^6 is hydrogen or lower alkyl.

4,622,400

PREPARATION OF CERTAIN M-AMINOPHENOLS AND THE USE THEREOF FOR PREPARATION OF LASER DYES

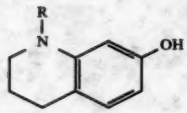
Peter R. Hammond, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 29, 1983, Ser. No. 566,924

Int. Cl.⁴ C07D *215/20, 215/36*

U.S. Cl. 546—179 **5 Claims**

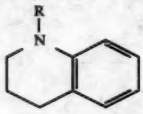
1. A method for preparing a compound of the Formula I:



(I)

wherein R is hydrogen or linear or branched alkyl of 1 to 10 carbon atoms, comprisihg the steps of:

(a) treating the compound of the Formula IA



(IA)

with a sulfonating agent selected from the group consisting of fuming sulfuric acid and acid sulfates at a temperature below about 40° C. by gradual addition of said compound of the Formula IA to an excess of said sulfonating agent to form a 7-sulfonated derivative of IA;

(b) converting said 7-sulfonated derivative to a sulfonate salt; and

(c) fusing the product of step (b) with alkaline metal hydroxide.

4,622,401
HETEROCYCLIC SUBSTITUTED-AMINO-PYRAZOLINES

John P. Dusza, Nanuet, N.Y.; Joseph P. Joseph, Montvale, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 628,936, Jul. 9, 1984, abandoned, which is a continuation of Ser. No. 472,397, Mar. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 282,699, Jul. 13, 1981, abandoned. This application Sep. 19, 1984, Ser. No. 651,966

Claims priority, application Canada, May 26, 1982, 403773; European Pat. Off., May 28, 1982, 82104682.8; Japan, Jul. 12, 1982, 57-120005

Int. Cl.⁴ C07D *401/04*

U.S. Cl. 544—405 **1 Claim**

1. A compound which is 2-(3-amino-5-methyl-2-pyrazolin-1-yl)-6-chloropyrazine.

4,622,402
PROCESS FOR PREPARING THIENO-FUSED HETEROCYCLIC ANTI-ULCER AGENTS AND INTERMEDIATES THEREFOR

Guy A. Schiehser, Malvern, and Donald P. Strike, St. Davids, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

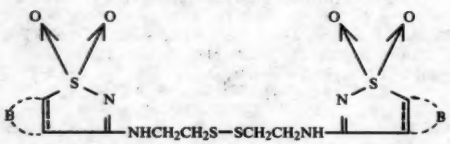
Continuation-in-part of Ser. No. 655,980, Sep. 28, 1984. This application Aug. 20, 1985, Ser. No. 767,558

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.⁴ C07D *275/00*

U.S. Cl. 548—212 **2 Claims**

1. A compound having the formula



wherein B is a moiety having the formula

and

R is hydrogen, mono- or dihalo, nitro, cyano, trifluoromethyl, lower alkyl, lower alkoxy, lowercycloalkyl, mono-or di-lower alkyl substituted amino, alkanoylamino, lower alkyl thio, loweralkylsulfonyl, sulfamoyl, lower alkyl substituted sulfamoyl, phenyl or phenyl substituted with halo, lower alkyl, lower alkoxy, trifluoromethyl, cyano or nitro.

4,622,403
6-H DIBENZ[B,F]THIEPIN COMPOUNDS

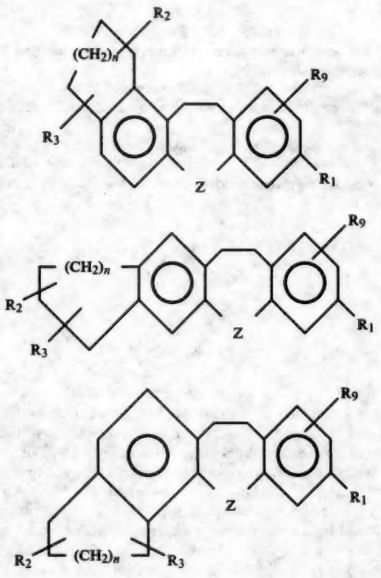
Haydn Williams, Dollard des Ormeaux, and Joshua Rokach, Laval, both of Canada, assignors to Merck Frosst Canada, Inc., Province of Quebec, Canada

Filed Oct. 11, 1983, Ser. No. 540,480

Int. Cl.⁴ C07D *409/02*

U.S. Cl. 548—252 **29 Claims**

1. A compound selected from the group consisting of dibenz thiepins having the structural formulae:



wherein

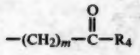
n is 1 or 2, the broken lines represent optional double bonds;

Z is a member selected from the group consisting of thio, sulfinyl, and sulfonyl;

R_2, R_3 and R_9 are the same or different and are members selected from the group consisting of hydrogen, halogen loweralkyl, loweralkanoyl, hydroxy, loweralkoxy, loweralkylthio, trifluoromethylthio, loweralkylsulfinyl, loweralkylsulfonyl, trifluoromethyl or R^2 and R^3 may together represent a double bonded oxygen;

R_1 is a member selected from the groups consisting of

(a) 5-tetrazolyl, and



wherein m is an integer of from 0 to 4 and R_4 is a member selected from the group consisting of hydroxy, loweralkoxy or amino

(b) —CHO

(c) $-(CH_2)_m-OR_8$ wherein m is 0–4 and R_8 is hydrogen and the pharmaceutically acceptable salts thereof.

4,622,404

IMIDAZOLINE COMPOUNDS CONTAINING SULFUR AND AMINO GROUPS

Neil E. S. Thompson, Creve Coeur; Derek Redmore, Webster Groves; Bernardus A. Oude Alink, St. Louis, and Benjamin T. Outlaw, Webster Groves, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

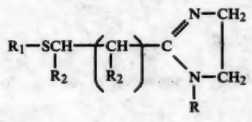
Division of Ser. No. 161,198, Jun. 19, 1980, Pat. No. 4,332,967. This application Nov. 10, 1981, Ser. No. 320,050

The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.

Int. Cl.[4] C07D *233/20*

U.S. Cl. 548—353 **6 Claims**

1. A composition of the following formula:



where R_1 is a hydrocarbon group, R_2 is H or alkyl, R is

and m is one to ten.

4,622,405

1,2,3,3A,8,8A-HEXAHYDRO-INDENO[1,2-C]PYRROLES USEFUL IN THE TREATMENT OF HYPERTENSION

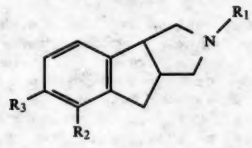
John F. DeBernardis, Lake Villa, and Martin Winn, Deerfield, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 634,235, Jul. 25, 1984, abandoned. This application Jan. 28, 1985, Ser. No. 695,520

Int. Cl.[4] C07D *209/56*; A61K *31/40*

U.S. Cl. 548—427 **3 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen, loweralkyl of 1 to 3 atoms, phenloweralkyl, loweracyl or benzoalkylenedioxy; R_2 and R_3 may be the same or different and are hydroxy, loweralkoxy, halo, thiomethyl, loweracyl, NR_4R_5, $NHSO_2R_6$ or phenloweralkoxy or R_2 and R_3 taken together may form a methylenedioxy or ethylenedioxy bridge; R_4 and R_5 may be the same or different and are hydrogen, loweralkyl of 1 to 2 carbon atoms or loweracyl; and R_6 is hydrogen or loweralkyl of 1 to 2 carbon atoms or a pharmaceutically acceptable salt thereof.

4,622,406

HYPOGLYCEMIC 5-SUBSTITUTED OXAZOLIDINE-2,4-DIONES

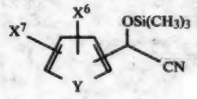
Rodney C. Schnur, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 542,241, Oct. 14, 1983, Pat. No. 4,562,267, which is a division of Ser. No. 353,777, Mar. 1, 1982, Pat. No. 4,423,233, which is a division of Ser. No. 252,961, Apr. 23, 1981, Pat. No. 4,332,952, which is a continuation-in-part of Ser. No. 173,206, Jul. 28, 1980, abandoned. This application Sep. 17, 1985, Ser. No. 777,109

Int. Cl.[4] C07F *7/02, 7/10*

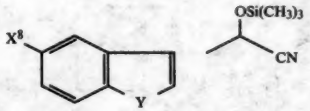
U.S. Cl. 549—4 **14 Claims**

1. A compound of the formula



(V)

or



(VI)

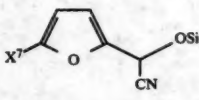
wherein

Y is sulfur or oxygen;

X^6 is hydrogen, fluoro, chloro, bromo, iodo, methyl, phenyl or (C_y-C_3)-alkoxy;

X^7 is hydrogen or methyl; and

X^8 is hydrogen, fluoro, chloro, bromo or iodo; with the proviso that the compound of the formula (V) is other than:



4,622,407

RESOLUTION OF RACEMIC DERIVATIVES OF 5-(1-METHYL-5-METHYLTHIOPYRROL-2-OYL)-1,2-DIHYDRO-3H-PYRROLO[1,2-A]PYRROLE-2-CARBOXYLIC ACID AND ANALOGS

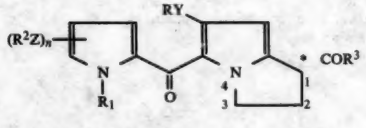
William K. Hagmann, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 26, 1984, Ser. No. 604,277

Int. Cl.[4] C07D *487/06*

U.S. Cl. 548—453 **5 Claims**

1. A process for resolving the racemic mixture of a compound of the structural formula:



(I)

*asymmetric center

wherein

R is

(a) H or C_{1-6}alkyl;

(b) C_{2-4}alkenyl;

(c) halo-C_{1-6}alkyl; or

(d) phenyl-C_{1-3}alkyl;

R^1 is hydrogen or C_{1-6}alkyl;

R^2Z is at position 5 and R^2 is R as defined above;

n is 1;

R^3 is hydroxy, C_{1-6}alkoxy or lower(alkanoylaminoalkoxy);

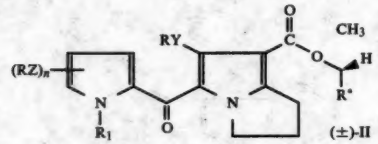
Y is oxygen, sulfur, CH_2— or with the proviso that when Y is H, R is absent; and

Z is —S—, —CH_2— or halo with the proviso that when Z is halo, R^2 is absent

comprising:

(a) optionally hydrolyzing a compound of formula (I) under basic conditions to form the racemic mixture of the compound of formula (I) wherein R^3 is OH;

(b) treating the racemic mixture with an optically pure asymmetric alcohol of formula R*OH wherein R* is asymmetric loweralkyl or (R)-(+)-α-phenethyl to form diastereomeric esters of formula (±)-II:



(±)-II

(c) resolving, by concomitant isomerization and fractional crystallization, (±)-II of step (b) to (−)-II isomer in the presence of a non-nucleophilic strong base, which is selected from a group consisting of tri-C_{1-6}alkylamine; pyridine; 2,4-dimethylpyridine; 1,5-diazabicyclonon-5-ene; and 1,8-diazebicycloundec-7-ene and which base is capable or rapidly isomerizing the diasteroemeric esters to a racemic mixture of 1:1 mixture of (±)-(II) but not capable of hydrolyzing the esters; and

(d) converting (−)-II to (−)-I via transesterification or hydrolysis without racemization under acidic and low temperature conditions.

4,622,408

VINYL PHENYLTHIOCARBONATE

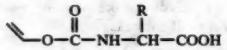
Angelina J. Duggan, Lawrenceville, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 139,323, Apr. 11, 1980, abandoned, which is a division of Ser. No. 18,956, Mar. 9, 1979, abandoned, which is a division of Ser. No. 948,717, Oct. 5, 1978, abandoned. This application Oct. 22, 1981, Ser. No. 313,921

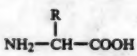
Int. Cl.[4] **C07C** *125/06, 101/02;* **C07D** *207/00, 209/20*

U.S. Cl. 548—533 **1 Claim**

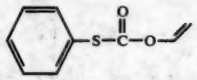
1. The process for preparing an N-protected amino acid



wherein R is the amino acid side chain which comprises reacting said amino acid



with vinyl phenylthiocarbonate



at a pH of 9.5 in a mixed solvent system of dioxane or DMF in water with a weak base.

4,622,409

N-(4-NITROPHENYL)-2-(HYDROXYMETHYL)-PYRROLIDINE AND DEUTERATED DERIVATIVES THEREOF

Jean-Francois Nicoud, 32, rue de Gometz, 91140 Bures-sur-Yvette, and Joseph Zyss, 28, rue Desaix, 75015 Paris, both of France

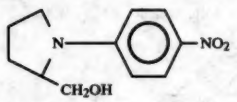
Continuation of Ser. No. 460,773, Jan. 25, 1983, abandoned. This application May 13, 1985, Ser. No. 733,420

Claims priority, application France, Jan. 26, 1982, 82 01166

Int. Cl.[4] **C07D** *207/08*

U.S. Cl. 548—570 **2 Claims**

1. A crystalline paranitroaniline derivative according to the following formula:



and exhibiting high optoelectronic second order harmonic qualities.

4,622,410

BICYCLO[3,3,0]OCTAN-3-ONES

Nobuyuki Hamanaka, Kyoto; Hideo Takada, and Yoshinobu Arai, both of Osaka, all of Japan, assignors to Ono Pharmaceutical Co. Ltd., Osaka, Japan

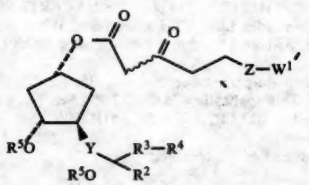
Filed Mar. 18, 1985, Ser. No. 712,446

Claims priority, application Japan, Mar. 19, 1984, 59-51058

Int. Cl.[4] **C07D** *307/93*

U.S. Cl. 549—304 **8 Claims**

1. A compound of the formula:



(I)

wherein Y and Z, which may be the same or different, each represents a trans-vinylene group or an ethylene group, R^2 represents a hydrogen atom or a methyl or ethyl group, R^3 represents a single bond or an alkylene group of 1 to 5 carbon atoms, R^4 represents an alkyl group of 1 to 8 carbon atoms, a cycloalkyl group of 4 to 7 carbon atoms unsubstituted or substituted by at least one alkyl group of 1 to 8 carbon atoms, a phenyl or a phenoxy group unsubstituted or substituted by at least one halogen atom, trifluoromethyl group or alkyl group of 1 to 4 carbon atoms, R^5 represents a hydroxy-protecting group which can be removed in acidic conditions and W^1 represents a group of the formula: —$COOR^1$, —$CON(R^6)_2$, —CH_2OR^5 or —$CH(OR^7)CH_2OR^5$ (in which R^1 represents a hydrogen atom or an alkyl group of 1 to 12 carbon atoms, the groups R^6, which may be the same or different, each represents

an alkyl group of 1 to 4 carbon atoms, a phenyl group or an aralkyl group of 7 to 12 carbon atoms, R^7 represents an acyl group of 2 to 12 carbon atoms and R^5 is as hereinbefore defined) with the proviso that, when R^3 represents a single bond, R^4 does not represent a substituted or unsubstituted phenoxy group.

4,622,411

ORGANOPALLADIUM-II-COMPLEX COMPOUNDS

Kirkor Sirinyan, Leverkusen; Henning Giesecke, Cologne; Gerhard D. Wolf, Dormagen; Harold Ebneth, and Rudolf Merten, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 449,043, Dec. 13, 1982, Pat. No. 4,493,861. This application Oct. 25, 1984, Ser. No. 664,668

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150985

Int. Cl.[4] C07F *15/00*

U.S. Cl. 556—136 **10 Claims**

1. An organopalladium-II-complex compound, wherein the palladium atom is attached to an oligomeric or polymeric compound of a conjugated diene or an unsaturated polyester.

4,622,412

PROCESS FOR PREPARATION OF MERCAPTO SILICONE FLUID

Charles Piskoti, 1595 Wagon Wheel Ln., Grand Blanc, Mich. 48439

Filed Aug. 21, 1984, Ser. No. 642,895

Int. Cl.[4] C07F *7/08, 7/18*

U.S. Cl. 556—429 **16 Claims**

1. A process for preparing a mercapto-functional silicone fluid, comprising:

(a) hydrolyzing a mercapto-functional silane and an organosilane corresponding to the formula:

$$R_x—Si—(OR')_{4-x}$$

wherein R and R' are each, independently selected from the group consisting of alkyl, aryl, alkaryl, aralkyl and halogenated hydrocarbon radicals, in the presence of a hydrolysis acid; and

(b) reacting together in the presence of an acid catalyst the hydrolyzed silanes of (a) with (1) an end-blocking polyalkylpolysiloxane and (2) a chain-extender which is either a cyclic polysiloxane or an alkyl or hydroxy-terminated silicone fluid.

4,622,413

METHOD FOR PREPARING AMINO ACID ESTER HYDROHALIDES

James A. Krogh, Mount Prospect, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 31, 1984, Ser. No. 645,894

Int. Cl.[4] C07C *67/08*

U.S. Cl. 560—38 **18 Claims**

1. A method comprising reacting amino acid, alcohol, and halocarbonyl compound represented by the formula:

in the presence of an excess of said alcohol with respect to said amino acid, and under substantially anhydrous conditions, to produce ester hydrohalide of said amino acid and said alcohol, wherein X_1 and X_2 are each independently fluoro, chloro, bromo, trichloromethoxy, or tribromomethoxy.

4,622,414

NOVEL CALIXARENE COMPOUNDS

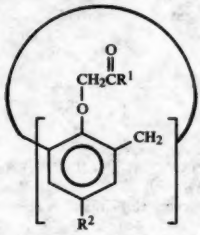
M. Anthony McKervey, Bishopstown, Ireland, assignor to Loctite Limited, Tallaght, Ireland

Continuation-in-part of Ser. No. 574,771, Jan. 27, 1984, abandoned, and a continuation of Ser. No. 673,621, Nov. 21, 1984, which is a continuation-in-part of Ser. No. 575,257, Jan. 30, 1984, abandoned. This application Dec. 3, 1984, Ser. No. 676,959

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—61 **9 Claims**

1. A compound of the formula



where R^1 is alkyl or alkoxy; R^2 is H or alkyl; and n equals 4,6, or 8.

4,622,415

OPTICALLY ACTIVE PHENOXYPROPIONIC ACID DERIVATIVES

Heinz Förster; Bernd Gallenkamp, both of Wuppertal; Uwe Priesnitz, Solingen; Hans-Jochem Riebel, Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

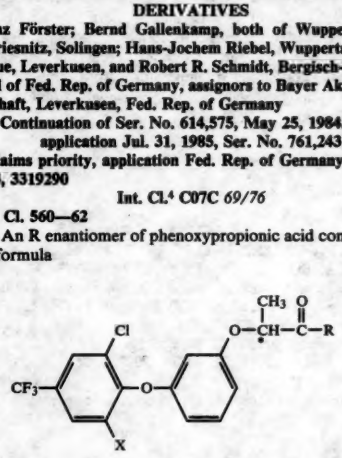
Continuation of Ser. No. 614,575, May 25, 1984. This application Jul. 31, 1985, Ser. No. 761,243

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319290

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—62 **20 Claims**

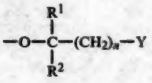
1. An R enantiomer of phenoxypropionic acid compound of the formula



in which

X represents hydrogen or chlorine, and

R represents hydroxyl, alkoxy, with 1 to 4 carbon atoms, chlorine or the radical of the formula



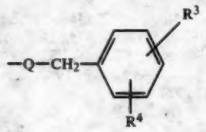
wherein

R^1 and R^2 independently of one another represent hydrogen or methyl,

n represents 0, 1 or 2 and

Y represents trimethylsilyl, pyrazolyl bonded via a ring nitrogen atom, or represents alkoxy with 1 to 4 carbon

atoms, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy part or the radical of the formula



wherein

Q represents oxygen or sulphur and

R^3 and R^4 are hydrogen.

4,622,416

CARBONYLATION OF ALLYLIC ETHERS TO ESTERS

Ronnie M. Hanes, Milford, and William D. Baugh, Wilmington, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Apr. 19, 1985, Ser. No. 725,290

Int. Cl.[4] C07C *67/36*; C11C *3/04*

U.S. Cl. 560—114 **18 Claims**

1. A method for the production of esters comprising reacting an allylic ether with carbon monoxide in the presence of a catalytically effective amount of a compound selected from the group of nickel halides, cobalt halides or iron halides or mixtures thereof to obtain acyclic and cyclic esters where said allylic ether has from about 5 to about 20 carbon atoms and said ester has from about 6 to about 21 carbon atoms, said reaction being conducted at temperatures from about 50° C. to about 200° C. and at pressures from atmospheric pressure up to about 5000 psig.

4,622,417

L-AMINODICARBOXYLIC-(O-CYCLOALKYL)-L-AMINOCARBOXYLATE ALKYL ESTER SWEETENERS

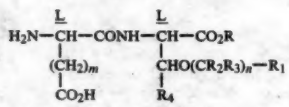
Ronald E. Barnett, Suffern; Paul R. Zanno, Nanuet, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 27, 1984, Ser. No. 686,570

Int. Cl.[4] C07C *69/74*; C07K *5/06*

U.S. Cl. 560—117 **60 Claims**

1. A compound represented by the formula:



wherein

R is alkyl containing 1–3 carbon atoms;

R_1 is cycloalkyl, cycloalkenyl, lower alkyl or substituted cycloalkyl or cycloalkenyl, bicycloalkyl, bicycloalkenyl or tricycloalkyl containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 and R_4 are each H or alkyl containing 1–3 carbon atoms;

R_3 is H, alkyl containing 1–6 carbon atoms or cycloalkyl containing 3–5 ring carbon atoms;

n=0, 1 or 2; and

m=0 or 1;

and food-acceptable salts thereof.

4,622,418

L-AMINODICARBOXYLIC ACID AMIDES

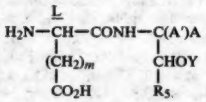
Ronald E. Barnett, Suffern; Paul R. Zanno, Nanuet, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 686,570, Dec. 27, 1984. This application Apr. 4, 1985, Ser. No. 719,664

Int. Cl.[4] C07C *69/74*; C07K *5/06*

U.S. Cl. 560—117 **90 Claims**

1. A compound represented by the formula:



wherein

A is hydrogen, alkyl containing 1–3 carbon atoms, hydroxyalkyl containing 1–3 carbon atoms or alkoxymethyl wherein the alkoxy contains 1–3 carbon atoms;

A′ is hydrogen or alkyl containing 1–3 carbon atoms; alternatively

A and A′ taken together with the carbon atom to which they are attached form cycloalkyl containing 3–4 carbon atoms;

Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;

R_1 is cycloalkyl, cycloalkenyl, lower alkyl substituted cycloalkyl or cycloalkenyl, bicycloalkyl, bicycloalkenyl or tricycloalkyl containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 and R_5 are each H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;

n=0 or 1; and

m=0 or 1;

and food-acceptable salts thereof.

4,622,419

PROCESS FOR THE OPTICAL RESOLUTION OF RACEMIC MIXTURES OF α-NAPHTHYL-PROPIONIC ACIDS

Vincenzo Cannata, and Giancarlo Tamerlani, both of Pontecchio Marconi, Italy, assignors to Alfa Chemicals Italiana S.p.A., Milan, Italy

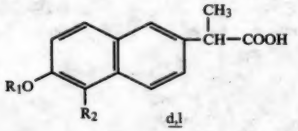
Filed Nov. 6, 1985, Ser. No. 795,516

Claims priority, application Italy, Nov. 22, 1984, 23689 A/84

Int. Cl.[4] C07B *57/00*; C07C *103/26*

U.S. Cl. 562—401 **18 Claims**

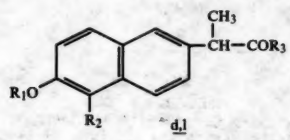
1. A process for the optical resolution of a racemic mixture of α-naphthyl-propionic acids of formula



I

wherein R_1 is straight or branched alkyl having from 1 to 6 carbon atoms and R_2 is hydrogen or halogen, which comprises the steps of:

(A) reacting a substantially racemic substrate of formula


II

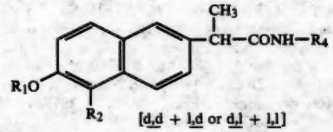
wherein R_1 and R_2 are as defined above and R_3 is a member selected from the group consisting of halogen, alkoxy containing from 1 to 8 carbon atoms, alkoxy containing from 1 to 8 carbon atoms substituted by halogen or phenyl or both, halogen and phenyl, aliphatic acyloxy containing from 2 to 6 carbon atoms, benzoyloxy, substituted benzoyloxy, sulfonyloxy, benzenesulfonyloxy, with a substance of formula

$R_4—NH_2$ III

wherein R_4 is the residue of a primary or secondary alcohol which, taken together with the $—NH_2$ radical, forms an optically active β-aminoalcohol, and has the formula,

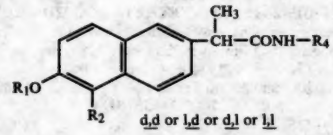
$R_5—CH(R_6)—CH_2—OH$ or the formula $R_6—CH(R_5)—CH_2—$

wherein R_5 is straight or branched alkyl, containing from 1 to 6 carbon atoms, primary hydroxyalkyl containing from 1 to 4 carbon atoms, phenyl, hydroxyphenyl, phenylmethyl, hydroxyphenylmethyl, naphthyl or indolyl and R_6 is straight or branched alkyl, containing from 1 to 6 carbon atoms, phenyl, hydroxyphenyl, dihydroxyphenyl and (4-hydroxy-3-methoxy)-phenyl, at a temperature between about room temperature and the boiling temperature of the reaction mixture, to obtain a pair of disatereoisomeric amides of formula


IV [d,d + l,d or d,l + l,l]

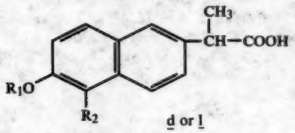
wherein R_1, R_2 and R_4 are as defined above;

(B) resolving said pair of diastereoisomeric amides into a single distereoisomeric amide by heating at a pre-determined temperature a molar amount of the pair of diastereoisomeric amides in a solvent or solvent system and adding at least a molar amount of a strong alkali agent, heating at a temperature between the temperature at which said alkali agent has been added and the boiling temperature of the reaction mixture for a period of time between 30 minutes and 12 hours and then gradually lowering the temperature to aid the crystallization whereby the desired single diasteroisomeric amide of formula


V d,d or l,d or d,l or l,l

is recovered, wherein R_1, R_2 and R_4 are as defined above, by filtration of the crystallized residue and subsequent treatment with water or by addition to the reaction mixture of an aqueous acidic solution, or water or of an aqueous solution of a mineral or organic acid, and

(c) subjecting the so obtained single diastereoisomeric amide to acid hydrolysis, thus recovering a compound of formula


VI d or l

in which R_1 and R_2 are as defined hereinabove.

15. An amide which is:

(a) (N-[l-2-(1-hydroxy)-butyl]-d-2-(6-methoxy-2-naphthyl)-propionamide;

(b) (N-[d-2-(1-hydroxy)-butyl]-l-2(6-methoxy-2-naphthyl propionamide;

(c) (N-[l-2-(1-hydroxy)-butyl]-d-2-(5-bromo-6-methoxy-2-naphthyl)-propionamide; or

(d) (N-[d-2-(1-hydroxy)-butyl]-l-2-(5-bromo-6-methoxy-2-naphthyl)-propionamide.

4,622,420

CHELATING AGENTS AND METHOD

Claude F. Meares; Simon M. Yeh, and David G. Sherman, all of Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 389,755, Jun. 18, 1982, abandoned, which is a continuation of Ser. No. 131,684, Mar. 18, 1980, abandoned. This application Feb. 5, 1985, Ser. No. 698,354

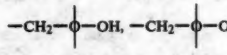
Int. Cl.[4] C07C *101/26*

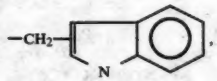
U.S. Cl. 562—443 **4 Claims**

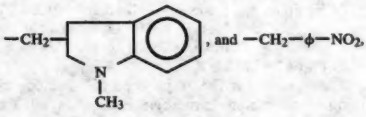
1. An optically active and substantially optically pure chelating agent comprising:

an EDTA, ED3A, or DTPA analog having a central ethylene moiety, said ethylene moiety being substituted at a one carbon thereof by an R moiety substituent, said R moiety substituent being an amino acid side group including a methylene group through which said amino acid side group is bonded, and selected from the group consisting of

$—CH_2—\phi$, $—CH_2—SH$, $—CH_3$, $—(CH_2)_4—NH_3^+$,







said one carbon defining an L or D stereochemical configuration for said EDTA, ED3A or said DTPA analog.

4,622,421

PHENYLALKANOIC ACID DERIVATIVES AND THEIR USE

Atsusuke Terada; Shunji Naruto, and Yoshio Iizuka, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

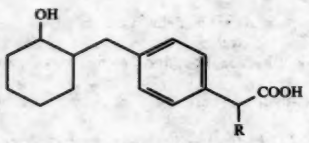
Division of Ser. No. 600,372, Apr. 16, 1984. This application Nov. 14, 1985, Ser. No. 798,236

Claims priority, application Japan, Apr. 21, 1983, 58-70794

Int. Cl.[4] C07C *59/54, 69/73*

U.S. Cl. 562—491 20 Claims

1. Compounds of formula (I):



(I)

(wherein R represents hydrogen or a C_1–C_3 alkyl group) and pharmaceutically acceptable salts and esters thereof.

4,622,422

CYCLOHEXANEALKANOIC ACIDS

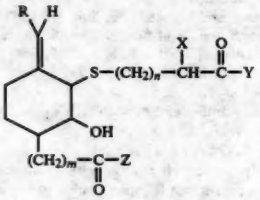
Robert J. Cregge, Zionsville, and Jeffrey S. Sabol, Indianapolis, both of Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Aug. 23, 1985, Ser. No. 768,769

Int. Cl.[4] C07C *149/26*; A61K *31/16, 31/19, 31/215*

U.S. Cl. 562—507 9 Claims

1. A compound of the formula:



wherein m is an integer from 1 to 5; n is an integer from 0 to 2; R is straight-chain alkyl containing from 8 to 15 carbon atoms; X is hydrogen or, when n is 1 or 2, X can be $—NH_2$; Y is hydroxy, —O—(lower alkyl), $—NH_2$, —NH(lower alkyl), —N—(lower alkyl)$_2$ or $—NHCH_2COOH$; and Z is hydroxy, —O—(lower alkyl), $—NH_2$, —NH—(lower alkyl), or —N—(lower alkyl)$_2$ and Z is the same as Y except that, when Y is $—NHCH_2COOH$, Z is hydroxy.

4. A compound according to claim 1 which is (1α,2β,3α,-4E)-3-[(carboxymethyl)thio]-2-hydroxy-4-tetradecylideneycyclohexaneacetic acid.

4,622,423

HYDROCARBOXYLATION OF BUTADIENE TO 3-PENTENOIC ACID

Patrick M. Burke, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 9, 1984, Ser. No. 669,851

Int. Cl.[4] C07C *51/14, 57/03*

U.S. Cl. 562—522 5 Claims

1. A process for the preparation of 3-pentenoic acid which comprises reacting in methylene chloride solvent, butadiene with carbon monoxide and water in the presence of a rhodium-containing catalyst and an iodide promoter at a temperature in the range 100°–220° C. and a pressure in the range 20–200 atm while maintaining the amount of water less than about 4.5% by weight based upon the weight of the solvent.

4,622,424

PREPARATION OF ACRYLIC ACID AND METHACRYLIC ACID IN A COMBINATION FIXED-FLUID BED REACTOR

James L. Callahan, Wooster; Arthur F. Miller, and Wilfrid G. Shaw, both of Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 729,446, May 1, 1985, abandoned, which is a continuation of Ser. No. 605,046, Apr. 30, 1984, abandoned, which is a division of Ser. No. 108,868, Dec. 31, 1979, Pat. No. 4,470,931, which is a division of Ser. No. 954,262, Oct. 24, 1978, abandoned. This application Sep. 6, 1985, Ser. No. 773,145

Int. Cl.[4] C07C *51/25, 57/05*

U.S. Cl. 562—545 2 Claims

1. In a process for the gas phase catalytic oxidation of propylene to acrylic acid, the improvement comprising conducting said oxidation in a fluid-bed reactor vessel, said vessel having a bed of catalyst particles contained therein and maintained in a fluidized state by the flow of reactant gases therethrough, and having within said fluidized catalyst particle bed above the point necessary for the mixing of the reactant gases, one or more fixed-bed catalysts retained within one or more fixed-bed catalyst supports, said supports having means for retaining a fixed-bed catalyst on top of the support, and means for allowing the fluidized catalyst particles to circulate through said fixed-bed catalyst.

4,622,425

PROCESS FOR THE PREPARATION OF AQUEOUS SOLUTIONS OF LOW MOLECULAR WEIGHT POLYACRYLIC ACIDS OR THEIR SALTS

Pierre Gagne, Tassin-La-Demi-Lune, France, assignor to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 175,582, Aug. 5, 1980, abandoned. This application Dec. 15, 1982, Ser. No. 450,137

Claims priority, application France, Aug. 24, 1979, 79 21336

Int. Cl.[4] C08F *120/06*

U.S. Cl. 562—595 17 Claims

1. A process for the preparation of low molecular weight polyacrylic acids, which comprises polymerizing acrylic acid in an aqueous solution containing a polymerization initiator and also in the presence of acetic acid and/or propionic acid, wherein the amount of acetic acid and/or propionic acid represents from about 20% to 40% of the weight of acrylic acid to produce an aqueous solution of polyacrylic acids having a weight average molecular weight of less than about 20,000.

4,622,426

PREPARATION OF N,N'-BIS(2-HYDROXYETHYL)OXAMIDE

Michel Crochemore, Chaponost, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Nov. 9, 1984, Ser. No. 670,062

Claims priority, application France, Nov. 9, 1983, 83 18077

Int. Cl.[4] C07C *102/06, 103/38*

U.S. Cl. 564—135 11 Claims

1. A process for the preparation of N,N'-bis(2-hydroxyethyl-)oxamide, comprising reacting an alkyl oxalate with ethanolamine in an aqueous reaction medium consisting essentially of water.

4,622,427

PROCESS FOR THE PREPARATION OF PARTIALLY HYDROGENATED DERIVATIVES OF 2-NITRO-1,1,1-TRIFLUOROALKANES

Bernd Baasner, Leverkusen; Heinz Ziemann, Leichlingen, and Erich Klaüke, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

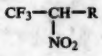
Filed Sep. 21, 1984, Ser. No. 653,386

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1983, 3336498

Int. Cl.[4] C07C *131/00*

U.S. Cl. 564—261 14 Claims

1. A process for the preparation of 2-oximino- and 2-nitro-1,1,1-trifluoroalkanes consisting essentially of catalytically hydrogenating a 2-nitro-1,1-,1-trifluoroalkane of the formula



in which R is selected from the group consisting of hydrogen, an alkyl radical having 1 to 15 C atoms, and a cycloalkyl radical having 5 to 8 C atoms, with a catalyst containing a metal selected from the group consisting of ruthenium, rhodium, palladium, platinum, cobalt and nickel, until a maximum of 2.2 moles of hydrogen per mole of 2-nitro-1,1,1-trifluoroalkane have reacted.

4,622,428

PREPARATION OF 1,3-DIAMINO-2,2-DIALKYLPROPANES

Franz Merger, Frankenthal; Dieter Voges, Mannheim, both of Fed. Rep. of Germany, and Siegfried Winderl, Tokyo, Japan, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 18, 1983, Ser. No. 543,161

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 3238931

Int. Cl.[4] C07C *85/06*

U.S. Cl. 564—480 5 Claims

1. A process for the preparation of a 1,3-diamino-2,2-dialkylpropane whose alkyl substituents are each of 1 to 4 carbon atoms which comprises: reacting a solvent solution of the corresponding 2,2-dialkylpropane-1,3-diol with ammonia in the presence of hydrogen under superatomospheric pressure in the presence of a cobalt-containing catalyst.

4,622,429

PROCESS FOR THE PREPARATION OF SUBSTITUTED BENZALDEHYDES

Heinz U. Blank, Odenthal; Erich Wolters, Niederzier, and Otto Neuner, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

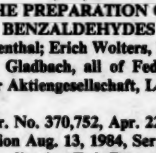
Continuation of Ser. No. 370,752, Apr. 22, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,414

Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118682

Int. Cl.[4] C07C *45/49*

U.S. Cl. 568—428 11 Claims

1. A process for the preparation of a substituted benzaldehyde of the formula



wherein

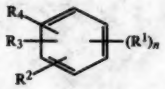
R^1 is selected from the group consisting of alkyl with 2 to 10 C atoms, substituted cycloalkyl and benzyl,

R^2 is selected from the group consisting of H, F, Cl, Br, unsubstituted phenyl, phenyl substituted by F, phenyl substituted by Cl and phenyl substituted by Br,

R^3 is selected from the group consisting of H, F, unsubstituted phenyl, phenyl substituted by F, phenyl substituted by Cl and phenyl substituted by Br,

R^4 is selected from the group consisting of H, F, or, in the case where R^3 and R^4 are adjacent, R^3 and R^4 together from a fused ring,

which process comprises contacting a substituted benzene of the formula

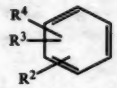


wherein

R^1 to R^4 have the meanings given above and

n denotes the number 1, 2 or 3,

with carbon monoxide and hydrogen chloride in the presence of a metal halide, the metal halide being employed in an amount of 1.0 to 1.5 mols per mol of substituted benzaldehyde expected to be produced, the hydrogen chloride being present in an amount of 0.5 to 10 mols of hydrogen chloride per mol of metal halide and the carbon monoxide being present at a partial pressure of 2 to 20 bars, at a temperature from −20° C. to +100° C., in the presence of a benzene of the formula



wherein

R^2, R^3 and R^4 have the meanings given above.

4,622,430

DERIVATIVES OF PENTACYCLO UNDECANES, PROCESSES FOR PREPARING THESE COMPOUNDS, AND PHARMACEUTICAL COMPOSITIONS THEREOF

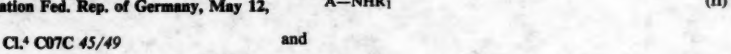
Theodor G. Dekker, Pretoria; Douglas W. Oliver, Potchefstroom; Friedrich O. Snyckers, and Cornelis J. van der Schyf, both of Pretoria, all of South Africa, assignors to Noristan Limited, South Africa

Filed Dec. 21, 1982, Ser. No. 452,028

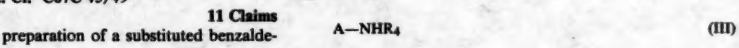
Int. Cl.[4] C07C *101/48*

U.S. Cl. 564—458 33 Claims

1. A compound of one of the formulae:

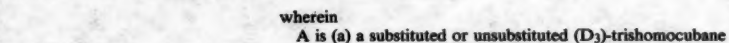


(I)



(II)

and



(III)

wherein

A is (a) a substituted or unsubstituted (D_3)-trishomocubane or (b) an alkyl- or aryl-substituted (D_3)-trishomocubane, being (a) for compounds (I) and (III);

R_1 is hydrogen, alkyl, aryl, halo, hydroxy, hydroxyalkyl or amino, each alkyl or aryl being optionally substituted by one or more similar or different substituents;

R_2 is aryl, amino, alkoxy, aryloxy or hydroxyalkyl, each alkyl or aryl being optionally substituted by one or more similar or different substituents;

R_4 is hydrogen (—H), optionally-substituted alkyl or optionally-substituted aryl;
or an acid-addition salt therof.

4,622,431

METHOD FOR CONVERTING ORGANIC CHLOROFORMATE TO THE CORRESPONDING ORGANIC CHLORIDE

Robert G. Briody, Clinton, and Henry C. Stevens, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 4, 1985, Ser. No. 720,200
Int. Cl.[4] C07C *41/18, 17/33*
U.S. Cl. 568—606 **19 Claims**

19. A method for preparing the corresponding halide of an organic haloformate of the graphic formula,

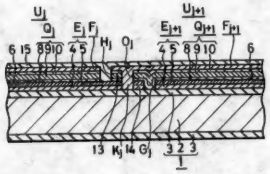
$$R\text{-}(OR')_xOC(O)X$$

wherein X is halogen, R is selected from the group consisting of C_1–C_{30} alkyl, C_5–C_6 cycloalkyl, C_1–C_4 alkyl-substituted C_5–C_6 cycloalkyl, phenyl, alkyl substituted phenyl of the graphic formula, $(R'')_aPh$—, wherein Ph is phenylene, R'' is C_1–C_{18} alkyl and a is an integer of from 1 to 3, phen(C_1–C_{18})alkyl, and C_1–C_{18} alkyl-substituted phen(C_1–C_{18})alkyl having a total of from 8 to about 28 carbon atoms, R' is the substituted ethylene group, —CH_2—CH(R''')—, wherein R''' is selected from hydrogen, methyl, ethyl and mixtures thereof, and x is a number from 0 to 40, provided that when R is phenyl or alkyl substituted phenyl, x is at least 1, which comprises heating said haloformate in the presence of a catalytic amount of solid poly(vinylpyridine) catalyst for a time sufficient to convert said haloformate to the corresponding halide.

4,622,432
PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Apr. 30, 1984, Ser. No. 605,663
Claims priority, application Japan, Apr. 29, 1983, 58-75713
Int. Cl.⁴ H01L *27/14*
U.S. Cl. 136—246 **16 Claims**

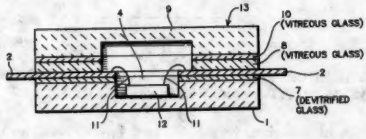


1. A photoelectric conversion device comprising:
a substrate formed by a flexible insulating sheet-like member having a metallic sheet-like member and an insulating film formed on the metallic sheet-like member, said insulating film comprising an organic resin having a thermal conductivity less than that of glass; and
a plurality n (n being an integer larger than one) of semiconductor elements U_1 to U_n sequentially formed on the substrate side by side and connected in series one after another in a predetermined direction;
wherein the semiconductor element U_i (i=1, 2, 3, . . . n) has a first electord E_i formed on the substrate, a non-single-crystal semiconductor laminate member Q_i formed on the first electrode E_i and having formed therein at least one semiconductor junction, and a second electrode F_i formed on the non-single-crystal-semiconductor laminate member Q_i in opposing relation to the first electrode E_i;
wherein the first electrode E_i is a reflective electrode having (a) a reflective conductive layer formed of Al, Ag, an Al alloy, or a Ag alloy and making contact with the insulating film and (b) a light transparent conductive layer formed on the reflective conductive layer and making contact with the non-single-crystal semiconductor laminate member Q_i;
wherein the second electrode F_i is transparent; and
wherein the second electrode F_{j+1} (j=1, 2, . . . (n−1)) of the semiconductor element U_{j+1} is coupled with the first electrode E_j of the semoconductor element U_j through a coupling portion K_j formed by an extension of the second electrode F_{j+1}.

4,622,433
CERAMIC PACKAGE SYSTEM USING LOW TEMPERATURE SEALING GLASSES

Thomas J. Frampton, Poway, Calif., assignor to Diacon, Inc., San Diego, Calif.

Filed Mar. 30, 1984, Ser. No. 595,180
Int. Cl.⁴ H01L *23/10*
U.S. Cl. 174—52 FP **19 Claims**

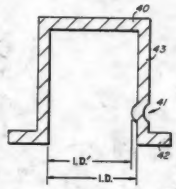


1. An enclosure for encapsulating an electronic component comprising:
a substrate having a perimeter;
a composite layer over said substrate, said layer having a first glass portion which is devitrified and is located over at least a part of said substrate and a second glass portion which is vitreous and is located above said first glass portion;
a conductive lead frame attached to said substrate and imbedded in said composite layer on said substrate, said lead frame having surfaces exposed for electrical contact both within and without the perimeter of said substrate.

4,622,434
SEMICONDUCTOR DEVICE PACKAGE AND METHOD THEREOF

Hart Shekerjian, Paradise Valley, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Nov. 19, 1984, Ser. No. 672,760
Int. Cl.⁴ H05K *5/03*
U.S. Cl. 174—52 H **8 Claims**

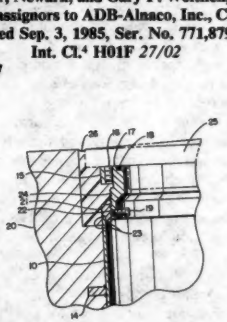


1. A package comprising:
a header;
cap means for mating with said header to form an enclosure; and
dimple means on said cap means for frictionally engaging said header.

4,622,435
ADJUSTABLE LIGHT BASE AND TRANSFORMER HOUSING

Willis H. Trainor, Newark, and Gary P. Weltlich, Pickerington, both of Ohio, assignors to ADB-Alnaco, Inc., Columbus, Ohio

Filed Sep. 3, 1985, Ser. No. 771,879
Int. Cl.⁴ H01F *27/02*
U.S. Cl. 174—57 **4 Claims**



1. An adjustable light base and transformer housing comprising a cylindrical housing closed at one end and open at the opposite end, said cylindrical housing being provided with a plurality of openings adjacent said closed end adapted to receive an electrical conduit, said open end being provided with a female threaded portion around its internal circumference adjacent to said open end, a hollow flange nut provided with a male threaded portion around its external circumference and movably engaging and mating with said female threaded portion of the internal circumference of said cylindrical housing, said hollow flange nut being provided with a plurality of threaded holes extending through said hollow flange nut parallel to the axis of said hollow flange nut and equi-spaced thereon

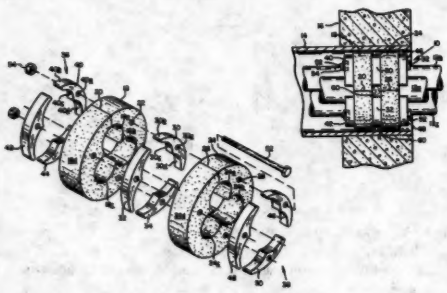
and adapted to receive bolts used in securing an inset light fixture to said flange nut, said hollow flange nut also being provided with a plurality of radially extending threaded holes extending through the male threaded portion of said hollow flange nut, a bolt threadedly engaging the threads of each of said radially extending threaded holes, with the head of each of said bolts positioned within the interior of said hollow flange nut, said bolts being of a length such that they can engage the female threaded portion of said cylindrical housing.

4,622,436

PLUG ASSEMBLY AND METHOD FOR ENCAPSULATING A CABLE WITHIN A CONDUIT

Frank R. Kinnan, Camas Valley, Oreg., assignor to L & F Company, Camas Valley, Oreg.

Filed May 21, 1985, Ser. No. 736,468
Int. Cl.[4] H02G *15/00*
U.S. Cl. 174—77 R **8 Claims**



1. A plug assembly for encircling at least one cable and encapsulating it within a conduit comprising:

a first ring member formed of resilient material having an inner wall conformable to a circumferential portion of a cable's outer surface;

a second ring member formed of resilient material disposed adjacent the first ring member, the second ring member also having an inner wall conformable to a circumferential portion of a cable's outer surface;

substantially rigid spacer means disposed between the first and second ring members for defining a sealant-receiving channel therebetween; and

compression means operable for deforming the first and second ring members axially and radially thereby to deform the channel so that at least some sealant material received in the channel is displaced into the region between the inner walls of the first and second ring members and corresponding portions of a cable's outer surface to provide a cushion/sealant between the ring members and a cable.

6. A method for encircling at least one cable and encapsulating it within a conduit comprising:

providing a plug assembly defined by a pair of spaced-apart first and second ring members, each of which is formed of resilient material having an inner wall conformable to a circumferential portion of a cable's outer surface, the plug assembly also including a rigid spacer disposed between the first and second ring members for defining a sealant-receiving channel therebetween;

dispensing sealant material into the channel;

positioning the plug assembly around a cable;

positioning the plug assembly within a conduit; and

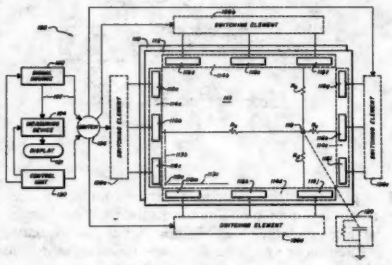
deforming the first and second ring members axially and radially thereby to deform the channel so that at least some sealant material received in the channel is displaced into the region between the inner walls of the first and second ring members and corresponding portions of a cable's outer surface to provide a cushion/sealant between the ring members and a cable.

4,622,437

METHOD AND APPARATUS FOR IMPROVED ELECTRONIC TOUCH MAPPING

Jonathan J. Bloom, Burlington; Michael J. Marino, Lynn, and Edward L. Pepper, Jr., Medford, all of Mass., assignors to Interaction Systems, Inc., Newtonville, Mass.

Filed Nov. 29, 1984, Ser. No. 676,186
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 **20 Claims**



11. In a human touch-responsive apparatus for determining the location of a current-drawing human touch to a touch-sensitive panel means, said panel means having extended thereon an electrically conductive layer of known spatial impedance properties and further having an electrode configuration in electrical contact with the layer, said apparatus having a source means for generating a signal to establish in said impedance layer a designated electrical state, said apparatus further having measuring means for determining the effective impedance from an electrode, of said electrode configuration, in contact with said layer, to said touch, for mapping the relative location of the touch, the improvement comprising

a first electrode network means disposed on said panel means at a selected location along a first panel axis, said electrode network means having at least three elongated electrode elements spaced-apart along a direction transverse to the first axis, each said electrode element being in electrical communication with said impedance layer;

a second electrode network means disposed on said panel means at a selected location along a second panel axis, said electrode network means having at least three elongated electrode elements spaced-apart along a direction transverse to the second axis, each said second electrode element being in electrical communication with said impedance layer;

said first and second electrode network means defining, in part, a touch-effected region of said panel means; and

a switching means for selectively electrically connecting, in a first mode, the source means with at least some of the electrode elements of the first and second electrode network means and for electrically isolating in a second mode, at least some of the electrode elements of the first and second electrode network means from said source means.

4,622,438

SUBSCRIBER LINE RADIO CONCENTRATION SYSTEM WITH AUTOMATIC RESPONSE FOR A LOOP BACK TEST

Takafumi Shimizu, Kawasaki, and Ichiro Tomizawa, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1984, Ser. No. 674,827
Claims priority, application Japan, Nov. 29, 1983, 58-223123
Int. Cl.[4] H04B *3/46*
U.S. Cl. 379—63 **11 Claims**

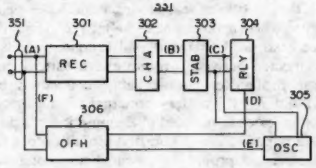
1. A subscriber line radio concentration system for concen-

trating a plurality of subscriber terminal stations through radio channels to a master station, at least one of said subscriber terminal stations comprising an automatic response equipment;

said automatic response equipment comprising:

a ringing signal rectifying circuit for rectifying a ringing signal transmitted from said master station through a subscriber line to said subscriber terminal station,

a charging circuit for boosting the voltage rectified by said ringing signal rectifying circuit;



a voltage-stabilizing circuit for providing a constant voltage when the output voltage from said charging circuit exceeds a predetermined value;

an oscillating circuit for generating a predetermined signal when said constant voltage is generated from said voltage-stabilizing circuit; and

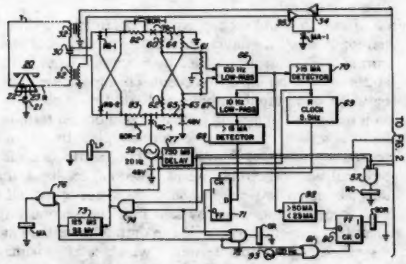
a quasi OFF HOOK setting circuit for conducting said predetermined signal from said oscillating circuit through said subscriber line to said master station.

4,622,439

DETECTION OF GROUND OR LOOP START CONFIGURATION IN TELEPHONE LOOP SIGNALLING CIRCUIT

Puran S. Kasbia, Kanata, and Yuan-Lu Li, Toronto, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 16, 1984, Ser. No. 600,944
Int. Cl.⁴ H04M *3/22, 7/14, 19/02*
U.S. Cl. 379—252 **4 Claims**



1. A loop signalling circuit for replicating signals from a central office on a remote terminal side of a telephone line and vice versa when said circuit is serially connected between the central office and the remote terminal, and the central office and remote terminal are operating in either a loop start or a ground start configuration, comprising:

first operational means for detecting a-c ringing signals from the central office on the telephone line;

second operational means for detecting spurious a-c signals of a frequency other than said rining signals, on the central office side of the telephone line; and

third operational means for detecting a d-c voltage which is greater than a preselected value across the central office side of the telephone line;

characterized by:

means for applying a d-c voltage relative to ground that is greater than said preselected value from a high impedance source to both tip and ring leads on the central office side of the telephone line, thereby resulting in a d-c voltage, across the central office side of the telephone line when in a ground start configuration, that is less than said preselected value; and

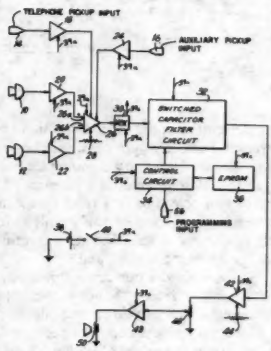
logic means responsive to absence of detection of the d-c voltage by the third operational means and absence of detection of the spurious a-c signals by the second operational means, for signalling a ground start configuration at the central office, and responsive to detection of the d-c voltage by the third operational means for signalling a loop start configuration at the central office.

4,622,440

DIFFERENTIAL HEARING AID WITH PROGRAMMABLE FREQUENCY RESPONSE

Martin J. Slavin, Dix Hills, N.Y., assignor to In Tech Systems Corp., Hauppauge, N.Y.

Filed Apr. 11, 1984, Ser. No. 599,137
Int. Cl.⁴ H04R *25/00, 3/04;* **H03G** *3/20*
U.S. Cl. 381—68.1 **27 Claims**



1. A hearing aid comprising a first microphone having an input oriented in a first direction; a second microphone having an input oriented in a second direction different from said first direction; subtractive circuit means for receiving the audio outputs of said first and second microphones and subtracting one of said audio signals from the other to produce a net audio signal, balance control means for electrically adjusting the input ratio of the audio signals from said first microphone and said second microphone, and an electro-acoustic transducer positioned to apply an acoustic signal to the user of the hearing aid in response to said net audio signal.

4,622,441

TWO-WIRE/FOUR WIRE COMMUNICATION INTERFACE WITH NOISE REJECTION

Philip T. Martin, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.

Filed Jun. 21, 1984, Ser. No. 623,267
Int. Cl.⁴ H04B *1/58*
U.S. Cl. 379—345 **17 Claims**

1. An interface circuit for coupling two-wire and four-wire communication channels comprising:

a first and a second power amplifying means for coupling data signals from an incoming section of said four-wire channel to first and second wires respectively of said two-wire channel, each of said power amplifying means having an input terminal;

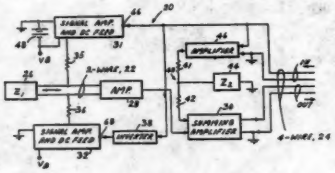
means for directing data signals from said two-wire channel to an outgoing section of said four-wire channel;

means connected between the input terminals of said first and said second power amplifying means and an output terminal of said directing means for inhibiting the coupling of a signal from said incoming section to said outgoing section of said four-wire channel, said first and said second power amplifying means being operative with an external source of electric power for applying a predetermined DC voltage to respective ones of said wires of said two-wire channel, each of said power amplifying means comprising:

an operational amplifying means for regulating DC voltage;

a DC feedback path connected between a first input terminal and an output terminal of said operational amplifying means,

a second input terminal of said operational amplifying means connecting with the input terminal of the power amplifying means; and



a biasing circuit coupled to said first input terminal of said operational amplifying means, said biasing circuit comprising a complementary semiconductor circuit having a plurality of semiconductor elements for rejection of noise of said power supply from said output terminal, a first terminal of each of said semiconductor elements being connected to said first input terminal of said operational amplifying means; and

a set of voltage divider circuits coupled to respective ones of said semiconductor elements and applying bias current thereto, each of said semiconductor elements having a second terminal for connection with a voltage divider circuit of said set of voltage divider circuits, said bias curents establishing the operating points of said semiconductor elements; and wherein

said interface circuit further comprises means for serially connecting said biasing circuit and said set of voltage divider circuits of said first power amplifying means and said biasing circuit and said set of voltage divider circuits of said second power amplifying means between terminals of said source of power.

4,622,442

ELECTRONIC HYBRID HAVING SYNTHESIZED IMPEDANCE CIRCUITRY

Philip T. Martin, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 564,637, Dec. 22, 1983, Pat. No. 4,567,331. This application Jul. 13, 1984, Ser. No. 630,801

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.[4] H04B *1/58*

U.S. Cl. 379—402 **2 Claims**

1. A circuit for coupling a two-wire transmission path to a four-wire transmission path, said coupling circuit comprising:

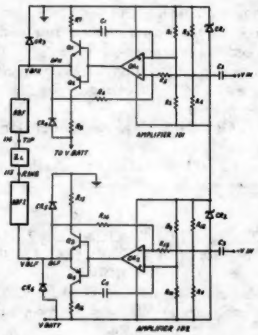
a first amplifier having inputs coupled to said two-wire transmission path and an output coupled to one side of said four-wire transmission path;

first and second circuits each prividing combined battery and voice signal injection to said two-wire path whereby AC voice signals are combined with DC battery potential, each having an input terminal coupled to the other side of said four-wire transmission path and each having an output terminal;

a first battery feed impedance coupled between said first circuit output terminal and one side of said two-wire path;

a second battery feed impedance coupled between said second circuit output terminal and the other side of said two-wire path;

a first protection circuit and a second protection circuit, each of said protection circuits comprising a set of serially connected diodes having a central node at the interconnection of two of said diodes, said diodes being poled for reverse bias upon connection between ground and battery potential, said first and said second circuits each being connected between ground and a battery potential, said first protection circuit being connected between the ground and the battery potential of said first circuit with central node connected to the junction of said first battery feed impedance and said first circuit output terminal, and said second protection circuit being connected between



the ground and the battery potential of said second circuit and with central node connected to the junction of said second battery feed impedance and said second circuit output terminal;

each of said first and second circuits comprising a differential input amplifier having first and second inputs and an output, a first resistor coupled between said input terminal and said first input, a first feedback impedance coupled between said output terminal and said first input;

circuit means coupling said output to said output terminal, a second resistor having one end coupled to a voltage source terminal and its other end coupled to said output terminal via said circuit means, a second feedback impedance coupled between said second resistor other end and said second input, whereby said first and second circuit means each operate to provide an output impedance at the respective said output terminal which is approximately zero for DC and is a predetermined non-zero value at voice frequencies.

4,622,443

SINGLE-POLE LOAD DISCONNECTING SWITCH ARRANGEMENT IN A HOUSING

Dietrich Mooz, Krefeld, Fed. Rep. of Germany, assignor to Felten & Guilleaume Energietechnik GmbH, Cologne, Fed. Rep. of Germany

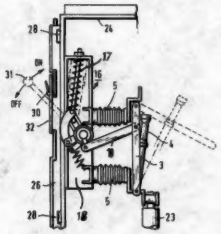
Filed Jul. 12, 1984, Ser. No. 631,940

Int. Cl.[4] H01H *9/00, 31/00*

U.S. Cl. 200—50 R **2 Claims**

1. An arrangement for mounting single-pole load-disconnecting switches in a middle voltage network, comprising a plurality of single-pole load-disconnecting switches; a common base frame, a common elongated shaft positioned in said frame;

a plurality of hubs positioned on said shaft and spaced from each other along said shaft, said hubs being each movable along said shaft so that the position of each hub on said shaft is adjusted, each switch being supported in said frame and having an independent drive operated for actuating said switch so that each single-pole switch can be actuated independently from the other switch, each of said hubs connecting an associated switch with the respective independent drive, each of said switches including a mounting support for accommodating the associated drive; a housing accommodating said frame, said shaft and said switches; at least one door for closing said hous-



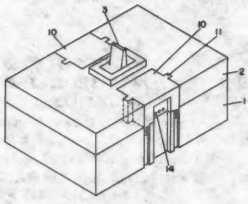
ing, each switch including a movable contact member; and coupling means provided to connect each hub to the associated movable contact member of the respective switch, and wherein each independent drive includes a first lever rigidly connected to an associated hub, a connecting member connected to said first lever and having a free end, a second lever also rigidly connected to said hub, a switching-on spring rigidly connected to the free end of said connecting member, and a switching-off spring connected to said second lever, whereby said switching-on and switching-off springs cooperate with the associated hub to switch on and off the associated switch.

4,622,444

CIRCUIT BREAKER HOUSING AND ATTACHMENT BOX

Kiyoshi Kandatsu; Naoshi Uchida, and Nobuo Asahi, all of Saitama, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 20, 1985, Ser. No. 703,316
Claims priority, application Japan, Jul. 20, 1984, 59-151805
Int. Cl.[4] H01H *9/02*
U.S. Cl. 200—303 **2 Claims**



1. A circuit breaker assembly comprising;

an outer box enclosing an attachment having an operating element for the circuit breaker and having an open bottom, a closed top, a front wall and a pair of side walls, each side wall including a linear projection extending vertically and the front wall having a central recess, outlet openings for lead wires in said recess, and first and second engaging means, each including an engaging hole and each projecting downwardly at opposite ends of the front wall; and

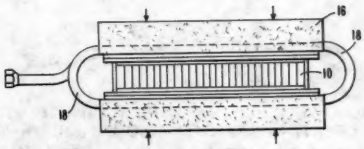
a circuit breaker housing comprising a cover portion and a case portion having an interior, the cover portion including a recess having an open top, a pair of side walls each provided with a linear channel, and a bottom wall which includes an opening, said outer box adapted to fit in the recess of the cover portion, the linear projections of the outer box fitting slidably in the channels of the side walls of the cover portion, the operating element of the attachment in the outer box adapted to extend through the opening in the bottom wall of the cover portion to the interior of the case portion, the front wall of the circuit breaking housing including a pair of channels each of which includes an interlocking projection, the pair of engaging means of the outer box adapted to fit into said pair of channels with the engaging holes accepting the interlocking projections.

4,622,445

METHOD OF INDUCTIVELY BRAZING HONEYCOMB PANELS

Marc R. Matsen, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1984, Ser. No. 655,540
Int. Cl.[4] H05B *6/10*
U.S. Cl. 219—10.41 **8 Claims**



1. A process for brazing at least one face sheet to a honeycomb core panel, said process comprising the steps of:

(a) placing a brazing alloy between said face sheet and said core;

(b) placing a heat resistant, rigid, thermal insulating member on said face sheet;

(c) pressing said face sheet against said brazing alloy and said honeycomb core panel;

(d) covering the portion of the face sheet and core panel to be brazed with an inert gas;

(e) applying heat to said alloy within said portion sufficient to increase the temperature of said alloy above its melting point by induction heating; and

(f) cooling said brazing alloy to a temperature below its melting point.

4,622,446

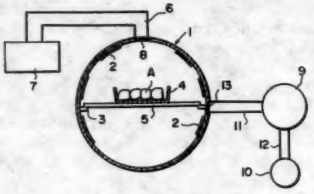
MICROWAVE DRYING APPARATUS AND USE THEREOF

Ko Sugisawa; Yasushi Matsumura, both of Nara; Kazumitsu Taga, Neyagawa, and Ryuichi Hattori, Kyoto, all of Japan, assignors to House Food Industrial Company Ltd., Osaka, Japan

Filed Dec. 9, 1983, Ser. No. 559,781
Claims priority, application Japan, Dec. 9, 1982, 57-186730[U]
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.55 R **65 Claims**

1. A reduced pressure microwave drying apparatus comprising a drying chamber for drying a material to be treated, a microwave oscillator, a waveguide and an exhaust means, said drying chamber having a weak dielectric substance applied onto at least part of the inner wall thereof, said waveguide being connected to the microwave oscillator at one end thereof and to a portion of the wall of the drying chamber at the opposite end which is composed of gas-impermeable and mi-

crowave-permeable material whereby microwaves are guided into the drying chamber, a part of guided microwaves are directly applied to the material to be treated and the remainder



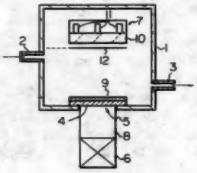
of guided microwaves are applied to the inner wall of the drying chamber, said exhaust means being a vacuum pump system comprising a cold trap and a vacuum pump.

4,622,447

MICROWAVE APPARATUS FOR VACUUM TREATING AND HEATING A SEMICONDUCTOR SUBSTRATE

Minoru Inoue, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 483,131, Apr. 8, 1983, Pat. No. 4,517,026. This application Feb. 25, 1985, Ser. No. 705,220
Claims priority, application Japan, Apr. 9, 1982, 57-59895
Int. Cl.⁴ H05B *6/80*
U.S. Cl. 219—10.55 R **6 Claims**



1. An apparatus for treating and heating a semiconductor substrate with microwaves, having a back surface and having a top surface to be treated, under a reduced pressure comprising:

a vacuum treating chamber having an opening, having an inside space and having a window plate pervious to microwaves placed over said opening; and

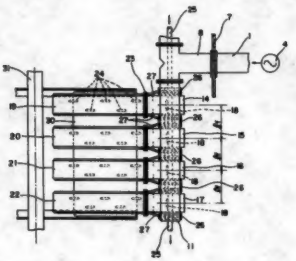
a microwave generator arranged outside of said vacuum treating chamber and positioned to radiate microwaves into said vacuum treating chamber through said opening, the semiconductor substrate being arranged in said vacuum treating chamber so as to expose the top surface of the semiconductor substrate to be treated to the inside space of said vacuum treating chamber and to cover said window plate with the back of the semiconductor substrate, the semiconductor substrate being larger than said opening in said vacuum treating chamber for shielding the inside space of said vacuum treating chamber from microwaves generated by said microwave generator.

4,622,448

MICROWAVE VACUUM DRYER APPARATUS

Hidenori Awata, Takarazuka; Shusaku Shimada, Nabari; Morio Kikuchi, Hiratsuka, and Kenichi Abe, Omiya, all of Japan, assignors to Osaka Gas Company, Limited and Kabushiki Kaisha Sofard, both of, Japan

Continuation of Ser. No. 518,305, Jul. 11, 1983, abandoned. This application Jul. 23, 1985, Ser. No. 758,040
Claims priority, application Japan, Feb. 19, 1982, 57-024519
Int. Cl.⁴ H05B *6/72*
U.S. Cl. 219—10.55 A **7 Claims**



1. A microwave vacuum dryer apparatus comprising,

a vacuum drying tank,

slot-array antenna means disposed in said vacuum drying tank, microwave generating means disposed outwardly of said vacuum drying tank and under ambient pressure,

waveguide means leading from said microwave generating means to said slot-array antenna means, and

blocking plates mounted between said microwave generating means and said slot-array antenna means,

said blocking plates each comprising a window formed of a material permitting easy passage of microwaves and a metal window frame,

said window having a strength to withstand a differential pressure between a vacuum in said vacuum drying tank and the ambient pressure outside thereof,

said metal window frame being disposed between the waveguide means and the antenna means, and further comprising at lest two irises, each iris provided an an end portion of the slot-array antenna in such a manner that reflected waves from the short-circuit wall and the window frame of the blocking plate are reflected by the irises so as to advance forward again into the antenna; wherein said window, said metal window frame and said slot-array antenna means operate to set up a closed type resonator.

4,622,449

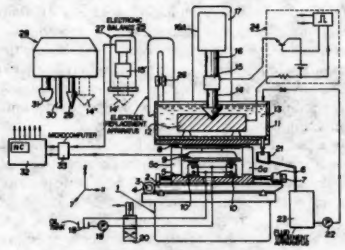
USING THE WEIGHT OF THE ELECTRODE OR WORKPIECE TO CONTROL EDM WORKING CONDITIONS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohamashi, Japan

Filed Apr. 26, 1983, Ser. No. 488,679
Claims priority, application Japan, Apr. 28, 1982, 57-70265
Int. Cl.⁴ B23H *7/00*
U.S. Cl. 219—69 R **19 Claims**

1. In an electrical discharge machine, in which a working gap is formed between a working electrode and a conductive workpiece, a pulse discharge is generated in said working gap between said electrode and said workpiece while supplying a working fluid to said electrode and said workpiece, and said electrode and said workpiece are relatively moved while maintaining a proper width of said working gap, thereby performing spark erosion, the improvement comprising at least one weight measuring means mounted on the electrical discharge machine for measuring the weight of at least one of said electrode and said workpiece, means establishing working condi-

tions for the spark erosion of said workpiece including means for relatively positioning the electrode and workpiece with respect to three mutually perpendicular axes, means for relatively moving the electrode and the workpiece, means for replacing the electrode, and power supply means for said



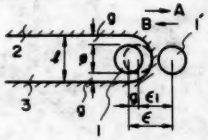
electrode and said workpiece and control means for controlling said means which establishes said working conditions in response to the measured weight to optimize said working conditions for the continuation of spark erosion of said workpiece.

4,622,450

METHOD OF MEASURING FLEXURE VALUE OF WIRE ELECTRODE

Mitsuo Kinoshita, Hachioji, and Haruki Obara, Sagamihara, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Continuation of Ser. No. 413,375, Aug. 25, 1982, Pat. No. 4,521,662. This application Jan. 30, 1985, Ser. No. 696,487
Claims priority, application Japan, Dec. 29, 1980, 55-185432
Int. Cl.[4] B23P *1/08*
U.S. Cl. 219—69 W **7 Claims**



1. A method of measuring a value of flexure of a wire electrode, the flexure being caused by an electric discharge across a discharge gap, the method comprising the steps of:

(a) detecting by ohmic contact detection means whether or not the wire electrode comes into contact with the workpiece when electric discharge is temporarily stopped at a predetermined measurement point during the course of electric discharge machining along a first direction in a machining groove;

(b) retracting said wire electrode relative to said workpiece in a second direction opposite said first direction along said machining groove until the wire electrode comes out of ohmic contact with the workpiece in the case where they lie in contact, a distance of the retraction being measured, or advancing said wire electrode relative to said workpiece in said first direction until the wire electrode comes into ohmic contact with the workpiece in the case where they do not lie in ohmic contact, a distance of the advance being measured; and

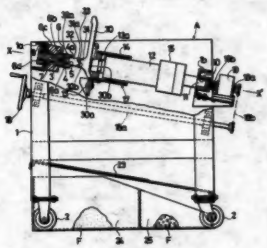
(c) calculating the flexure value in accordance with the size of the discharge gap, and the retraction distance or the advance distance.

4,622,451

APPARATUS FOR REBUILDING WORN SHOE GROUSER FOR TRACK CHAIN

Yasumitsu Moriki, and Masahiro Sakurai, both of Tokyo, Japan, assignors to Maruma Jyusharyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 698,934
Claims priority, application Japan, Jun. 22, 1984, 59-127588
Int. Cl.[4] B23K *9/04*
U.S. Cl. 219—76.1 **12 Claims**



1. Apparatus for rebuilding worn shoe grousers for a line of track chain by welding operations comprising:

a framework;

means for holding an elongate lug having a double bevelled longitudinal edge horizontally in position to be welded to a shoe, said lug holding means being rotatably mounted in said framework for rotation about a horizontally extending axis perpendicular to the length of said lug,

means for holding a shoe in position to be welded to said lug, said shoe holding means being mounted in said framework for rotation coaxially with said lug holding means and for movement axially toward said lug holding means,

thruster means for moving said shoe holding means axially toward said lug holding means forcibly to press a lug held by said lug holding means and a shoe held by said shoe holding means together for welding of said lug to said shoe, said thruster means being mounted in said framework for rotation coaxially with said lug holding means and said shoe holding means, and

means for rotating said lug holding means, said shoe holding means and said thruster means together 180° about said axis between a first position in which said lug is horizontal with a first side of said lug facing upwardly for making a first weld of said lug to said shoe and a second position in which a second side of said lug faces upwardly for making a second weld of said lug to said shoe while maintaining pressure between said shoe and lug.

4,622,452

ELECTRIC ARC VAPOR DEPOSITION ELECTRODE APPARATUS

Clark Bergman, Roseville, and Gary E. Vergason, Minneapolis, both of Minn., assignors to Multi-Arc Vacuum Systems, Inc., St. Paul, Minn.

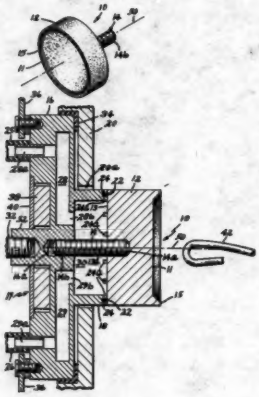
Filed Jul. 21, 1983, Ser. No. 515,568
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PR **25 Claims**

1. A consumable electrode adapted for use as a coating source in an electric arc physical vapor deposition machine of the type having, means for holding said electrode and means for sealingly engaging said electrode, said electrode comprising:

(a) a body of consumable coating source material generally disposed about a longitudinal axis and having a front surface, a rear surface opposite said front surface, a broad rear central portion proximate to said longitudinal axis at said rear surface, and a periphery near the outer edge of

said rear surface, said periphery adapted to be sealingly engaged by said engaging means; and

(b) means operatively connecting said rear central portion of said body to said holding means for applying rearward tension to said body in a direction substantially parallel to said longitudinal axis of said body; wherein said rearward



tension places said body periphery in sealing engagement with said engaging means so as to define a sealed coolant cavity that extends below substantially the entire said rear surface of said body when said body is operatively connected to said holding means, whereby substantially the entire rear surface of said body is directly cooled.

4,622,453

ELECTRON BEAM GUN MOUNTING ON A WORK CHAMBER

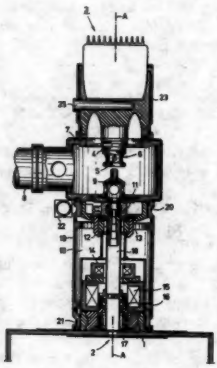
Helmut Spruck, Gilching, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 624,987

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328172

Int. Cl.[4] B23K *15/00*

U.S. Cl. 219—121 ET **10 Claims**



1. An electron beam gun mounting on a work chamber and comprising:

an electron beam generator;

an acceleration chamber having an acceleration anode disposed therein; and

a beam-guide chamber having jacket tube means and beam-guide tube means inside said jacket tube means and extending between the acceleration anode and the work chamber and surrounded by at least one focusing lens and deflecting means and including a centering flange, the jacket tube means comprising a hollow cylinder and being effective as supporting means coupling together the acceleration chamber and the work chamber, the jacket tube means having upper and lower ends and comprising upper connecting flange means at said upper end and lower connecting flange means at said lower end, each of which is attached to and detachable from the beam-guide tube means, the upper connecting flange means comprising a carrier ring portion for the vacuum-tight disposition of the centering flange, said centering flange being disposed in said carrier ring portion and being disposed at said upper end of said jacket tube means, the lower connecting flange means comprising an internal vacuum-connection flange portion, the beam-guide tube means having upper and lower ends and being suspended at its upper end by the centering flange in a detachable and vacuum-tight manner and being inserted at its lower end in the vacuum-connection flange portion in a vacuum-tight manner, and when the beam generator is removed, the beam-guide tube means, including the centering flange, being extractable from the focusing lens and from the deflector means through the acceleration chamber.

4,622,454

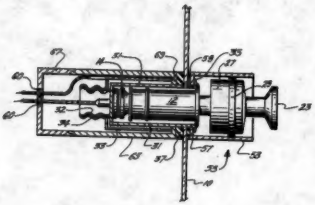
WATERPROOF CIGARETTE LIGHTER

Leopold A. Castille, Rte. 7, Box 17 E15, Opelousas, La. 70570

Filed May 30, 1985, Ser. No. 739,995

Int. Cl.[4] H05B *1/00*; F23Q *7/00*

U.S. Cl. 219—267 **14 Claims**



1. In a push-pull type electric lighter assembly comprising:

(a) a handpiece which includes longitudinally slidable tubular carrier means having an inner end and an outer end, an electrically heatable ignition member carried by and positioned in proximity to the inner end of the carrier means, and a knob mounted on the outer end of the carrier means, and

(b) socket means slidably receiving the carrier means and adapted to electrically energize the ignition member when the carrier means is moved into an inner position in the socket means,

the improvement wherein the assembly further comprises:

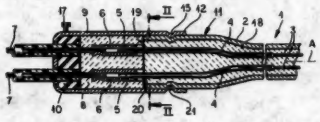
(c) hollow tubular housing means encasing the carrier means, the ignition member and the socket means, the outer end portion of the housing means being open to permit insertion of the handpipe into and removal of the handpiece from the socket means by means of the knob, and

(d) sealing means to effect a watertight, slidable seal between a peripheral portion of the knob and the housing means yet permit the carrier means to be moved by means of the knob into said inner position in the socket means.

4,622,455
CONNECTION ASSEMBLY FOR ELECTRIC CARTRIDGE HEATER

Eugen Schwarzkopf, Lüdenscheid, Fed. Rep. of Germany, assignor to Hotset Heizpatronen und Zubehor GmbH, Lüdenscheid, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 733,228
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, 3427207
Int. Cl.[4] H05B *3/08*
U.S. Cl. 219—541 **13 Claims**



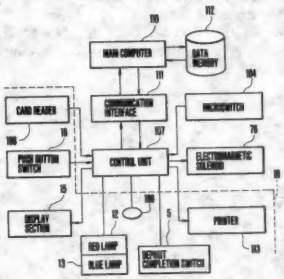
1. A heating-cartridge assembly comprising
an electrically conductive first shell;
a first rigid and electrically insulating body in the shell having a longitudinally directed end face;
an electrical heating conductor imbedded in the body and having a pair of ends;
respective highly electrically conductive and stiff wires imbedded in the body, connected to the ends, and having uninsulated wire ends spaced transversely from each other and projecting longitudinally from the face of the body;
a second rigid electrically insulating and ceramic body independent of the first body and having a respective face;
a pair of highly electrically conductive tubular sockets imbedded in the second body, having outer ends exposed at the second-body face and inner ends, and lying parallel to each other at the same transverse spacing as the projecting uninsulated wire ends, these projecting stiff wires being complementarily and snugly engageable in the tubular sockets with the faces of the two insulating bodies abutting longitudinally;
respective electrical feed conductors connected to the inner ends of the tubular sockets; and
an electrically conductive and tubular second shell tightly receiving the second body and projecting therefrom longitudinally past the faces and fitting in good electrical contact snugly around the first shell when the projecting ends are fitted in the sockets and the two faces are abutting.

4,622,456
AFTER HOUR DEPOSITORY

Eiro Naruto, and Hiroshi Masachika, both of Hiroshima, Japan, assignors to Kumahira Safe Co. Inc., Hiroshima, Japan

Filed May 16, 1984, Ser. No. 610,808
Claims priority, application Japan, Feb. 8, 1984, 59-21304
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **6 Claims**

1. In an after-hour depository, powered by electricity, of a type including a throw-in door turnably housed in a frame fitted into an opening on a building, said throw-in door comprising a fragmental cylinder member and a movable wall, and being adapted to operate such that when a client uses an envelope as a depositing means, said throw-in door assumes a first door opened position creating a V-shaped pocket defined between the partition wall of the fragmental cylinder member and the movable wall when said throw-in door is half opened, and when said client uses a cash bag as a depositing means, said throw-in door assumes a second door opened position where said pocket is fully opened, the improvement consisting of said depository further including;
a control panel to control the turning movement of said throw-in door,
a control circuit electrically connected to said control panel and having a data memory for filing client related information within said data memory, and

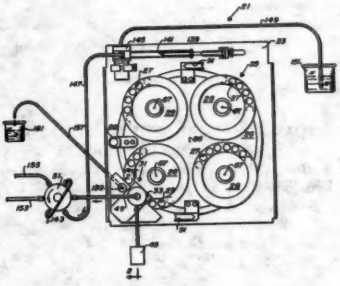


a locking and unlocking apparatus to lock or unlock said throw-in door in accordance with a command issued from said control circuit.

4,622,457
AUTOSAMPLER MECHANISM

Martin P. T. Bradley, Cupertino; Leslie A. Miller, San Jose; Thomas J. McCall, Fremont, and Duane L. Middlebusher, San Jose, all of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Division of Ser. No. 241,810, Mar. 9, 1981, Pat. No. 4,478,099.
This application Jul. 3, 1984, Ser. No. 627,442
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—464 **2 Claims**

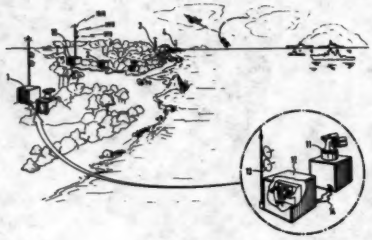


1. A bar code reading apparatus for reading bar code labels on sample vials, said bar code reader apparatus comprising,
a plurality of sample vials,
each sample vial comprising a generally cylindrically shaped container,
a bar code label attached to the outer cylindrical surface of the vial with the bar codes extending generally parallel to the cylindrical axis of the vial,
sensor means mounted at a fixed location for reading the bar codes on the label,
and vial transport means for rotating the sample vial with attached bar code label in front of the sensor means, and
wherein the vial transport means also move the vial longitudinally with respect to the sensor means so that the sensor means read a helical path on the bar code label.

4,622,458
TRAJECTORY ACQUISITION AND MONITORING SYSTEM

Hans-Joachim Boeck, Delmenhorst; Jürgen Fryen, Weyhe, and Ulrich Meyer, Lilienthal, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Bremen, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,827
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244255
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—203 R **7 Claims**



1. A trajectory acquiring and tracking system comprising, a plurality of several autonomous, spatially separated and mobile track control stations each including a plurality of passive optical electronical sensors operating in different ranges of the electromagnetic spectrum and acquiring information received from an object or objects in real time, for object acquisition as a target and target tracking;

each track control station including an instrument carrier being adjustable automatically for elevation and azimuthal orientation and carrying the respective sensors pertaining to that station;

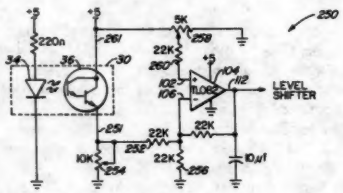
a control center provided for real time operation and coordination as well as triangulation on the basis of acquired position and tracking data; and

an information linking and distribution system coupling the control stations of the plurality to the control center for bi-directional data communication.

4,622,459
TONOMETER WITH OPTICAL SENSING AND VARIABLE ATTENUATOR

Harry A. Bouge, Project City, and Tim O. Haley, Central Valley, both of Calif., assignors to Professional Technologies Corp., Redding, Calif.

Filed Aug. 6, 1984, Ser. No. 638,047
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 A **13 Claims**

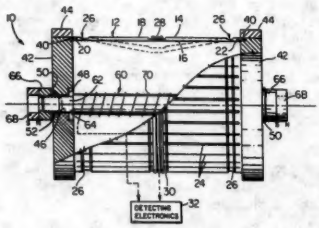


1. An optical sensor system, which comprises a light source, a detector positioned to receive light from said light source, a variable attenuator positioned to intercept a portion of light from said light source directed at said detector, a signal level detecting amplifier coupled to said detector to receive a first output signal from said detector which varies throughout a range of levels depending on an extent of attenuation by said variable attenuator in response to light from said light source received by said detector, said signal level detecting amplifier having an non-inverting input and an inverting input, said signal level detecting amplifier being connected to receive the output signal from said detector at one of said inputs, and means connected to another of said inputs of said signal level detecting amplifier to establish a bias voltage at said other input, which is within about 80 percent of signal levels supplied by said detector to the one input of said signal level detecting amplifier throughout the range of levels, said signal level detecting amplifier producing a second outut signal which varies continuously throughout the range of levels of the one input signal and proportionally relative to the one input signal levels.

4,622,460
FIBRE OPTIC MAGNETIC SENSOR

Michael Failes, Moffat, and Pantazis Mouroulis, Mississauga, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Aug. 16, 1985, Ser. No. 766,369
Claims priority, application Canada, Nov. 13, 1984, 467697
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **17 Claims**



1. A fibre optic magnetic sensor, comprising:

a thin-walled barrel having an elastically, radially deformable central portion intermediate opposed ends;

a single mode optical fibre wound about said central portion of said barrel;

an actuating element having a longitudinal dimension and being formed of a magnetostrictive material such that changes in the magnitude of a magnetic field within which said element is immersed result in changes in the length of said dimension;

means connecting said barrel to said actuating element so that changes in said dimension are transmitted axially to said barrel and result in radial deformation of said central portion of said barrel and a magnetic field strength related strain in said optical fibre; and

means for producing a bias magnetic field within said barrel.

4,622,461
DEVICE FOR OPTICAL CODE READING, BY DIASCOPY, AND A PROCESS FOR MANUFACTURING SAME

Jacques A. J. Taillebois, Plaisir, France, assignor to M.C.B., Courbevoie Cedex, France

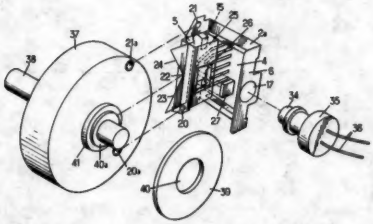
Filed Apr. 16, 1984, Ser. No. 600,452
Claims priority, application France, Apr. 20, 1983, 83 06482
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **12 Claims**

1. a device for reading an optical code by diascopy comprising in combination:

a metal chassis bent into a U-shape and having (a) a light source support carried by one of two sides of the U-

shaped chassis, and (b) a support for a photosensitive integrated circuit chip, (c) an indented lateral wing carried by the other side of the U shaped chassis, (d) connections for connecting an integrated circuit to said chip support, and (e) mounting lugs;

a light source disposed in said light source support and adapted to supply a beam of light;



a photosensitive integrated circuit chip having at least one photo-detector with its associated amplification and shaping circuits , said reading device being adapted to be mounted by means of said mounting lugs to a mechanical member having an optically coded track, said indented lateral wing ensuring correct optical superimposition of the reading device with said optically coded track.

4,622,462

METHOD AND APPARATUS FOR THREE-DIMENSIONAL SCANNING

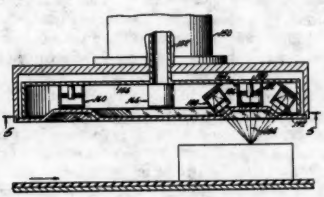
Homer L. Eaton, and John D. Shaylor-Billings, both of Leucadia, Calif., assignors to MTS Vektronics Corporation, Carlsbad, Calif.

Continuation-in-part of Ser. No. 383,950, Jun. 1, 1982, Pat. No. 4,475,035, which is a continuation-in-part of Ser. No. 272,757, Jun. 11, 1981, abandoned. This application Mar. 23, 1983, Ser. No. 477,744

The portion of the term of this patent subsequent to Oct. 2, 2001, has been disclaimed.

Int. Cl.⁴ H01J *3/14*

U.S. Cl. 250—236 **25 Claims**



2. Apparatus according to claim 1 wherein said one receiver includes means for generating signals representing elevations of said illuminated areas relative to said plane.

4,622,463

TWO-PULSE TRACER EJECTION METHOD FOR DETERMINING INJECTION PROFILES IN WELLS

Alfred D. Hill, Austin, Tex., assignor to Board of Regents, University of Texas System, Austin, Tex.

Filed Sep. 14, 1983, Ser. No. 532,160

Int. Cl.⁴ G01V *5/04*

U.S. Cl. 250—259 **10 Claims**

1. A method of tracer logging to determine the injection profile of a well, comprising the steps of:

injecting a first slug of tracer material into a carrier fluid at a location above any point of fluid exit from a wellbore;

injecting a second slug of tracer material into the carrier fluid so as to be a known distance from the first tracer slug;

moving a tracer material detector through the slugs to determine the distance between the two tracer slugs at a known depth in the wellbore; and

calculating the amount of fluid exiting the wellbore based upon the distance determination.

4,622,464

INFRARED GAS ANALYZER

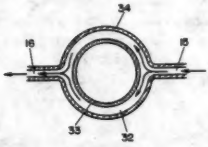
Kunio Sukigara, and Harutaka Taniguchi, both of Yokosuka, Japan, assignors to Fuji Electric Co., Ltd. and Fuji Electric Corporate Research & Development Ltd., both of, Japan

Filed Nov. 15, 1984, Ser. No. 672,091

Claims priority, application Japan, Nov. 15, 1983, 58-214442

Int. Cl.⁴ G01J *1/00*; 250 *343*; 356 *437, 439, 440*

U.S. Cl. 250—343 **6 Claims**



1. An infrared gas analyzer for measuring the concentration of a component of a gas being examined by the infrared absorption of the gas component comprising an infrared radiation source, a measuring cell and an infrared radiation detector, the measuring cell comprising a tubular case having an inlet and outlet for the gas being examined and a tubular filter within the case, the inside wall of the tubular case being concentric with the tubular filter and both ends of the tubular case having infrared transmission windows, the inner wall of the case being spaced from the tubular filter so that the gas being examined is allowed to flow along the periphery of the tubular filter for filtered gas to flow into the interior of the filter, the source and the detector being aligned on opposite ends of the tubular case for directing the infrared radiation to be absorbed longitudinally along the interior of the filter.

4,622,465

ARRANGEMENT FOR DETERMINING THE PRESENCE OF SPECIFIC SUBSTANCES IN A LIQUID

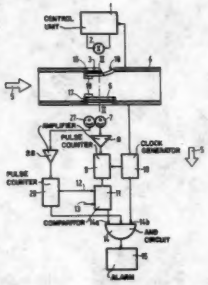
Egon H. A. Harig, and Gerd H. Martens, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,676

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315443; Feb. 21, 1984, 3406176

Int. Cl.[4] G01N *21/59, 21/15*

U.S. Cl. 250—373 13 Claims



1. An arrangement for determining the presence of substances in liquids comprising

a light source emitting diffuse light with UV components,

container means receiving said diffuse light for containing liquids, said container means passing said diffuse light through said liquids and said container means,

light detector means receiving said diffuse light passing from said container means for detecting at least UV light and providing a measurement signal having a value increasing with light intensity, said light detector means being at least one phototube, said phototube generating a train of pulses having a pulse frequency increasing with said light intensity,

processing circuit means receiving said measurement signal for generating an alarm signal if said measurement signal becomes smaller than a predetermined value, said processing circuit means including at least one pulse counter for counting said train of pulses, said pulse counter being set at a first preset value at the beginning of measuring intervals, and alarm means for providing said alarm signal when said pulse counter fails to reach a second preset value at the end of said measuring intervals.

4,622,466

PRESSURE VESSEL OF AN X-RAY DETECTOR

Hisaaki Tamura, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 12, 1984, Ser. No. 649,597

Claims priority, application Japan, Sep. 14, 1983, 58-170901

Int. Cl.[4] H01J *47/02*

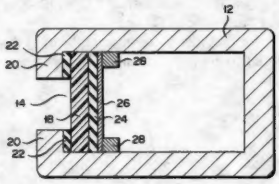
U.S. Cl. 250—374 4 Claims

1. A pressure vessel of an X-ray detector in which a high pressure gaseous medium substantially opaque to X-rays is contained, the gaseous medium being ionized upon impingement of X-rays, the intensity of impinged X-rays being determined based on the degree of ionization of the gaseous medium, the pressure vessel comprising:

a container of a curved pillar shape with a window through which the X-ray passes, the container being made of a metal, the window facing the center of the curvature;

a carbon fiber-reinforced plastic sheet fixed in the container to cover the window;

a polyaramide sheet attached to the inside of the carbon fiber-reinforced plastic sheet to cover the window; and



a metal foil attached to the inside of the polyaramide sheet to cover the window.

4,622,467

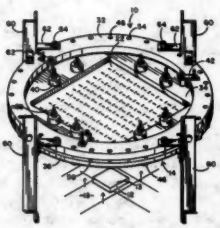
SYSTEM FOR MAPPING RADIOACTIVE SPECIMENS

Roy J. Britten, Costa Mesa, and Eric H. Davidson, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 660,692, Oct. 15, 1984, which is a continuation-in-part of Ser. No. 370,333, Apr. 21, 1982, Pat. No. 4,500,786. This application Dec. 17, 1984, Ser. No. 682,533

Int. Cl.[4] G01T *1/185*

U.S. Cl. 250—389 12 Claims



1. An apparatus for detecting radioactive sources on a test specimen, the apparatus comprising:

a counter having a gas filled chamber, said chamber being formed by an electrically conductive planar window and a parallel semiconductive surface spaced from said window, and adapted for having an electric field imposed within said chamber by a voltage differential between said window and said semiconductive surface;

an encoder surface spaced from said semiconductive surface and having geometrically arrayed elements thereon for receiving an electrical charge induced on said elements by an ion avalanche occurring within said chamber in response to entry of a radioactive particle into said chamber;

a dielectric layer between said semiconductive surface and said encoder surface, said semiconductive surface forming a coating on one side of said layer and said arrayed elements forming a coating on the opposite side of said layer;

means for coupling each said element to a row wire and to a column wire which are electrically isolated from each other whereby a preselected fraction of coupled charge current is transferred to each wire defining an element, the amplitude of the respective transferred charge fraction depending upon the location of the charge current relative to the element;

a plurality of charge sensitive integrating amplifiers, one such amplifier being connected to each row wire, respectively, and one such amplifier being connected to each column wire, respectively;

a plurality of sample and hold circuits, each of such circuits

being connected to a respective one of said amplifiers for selectively sampling and holding an analog signal created by said induced electrical charge;

means controlling said sample and hold circuits for selectively holding said analog signal when the summed output of all said sample and hold circuits exceeds a predefined threshhold level; and

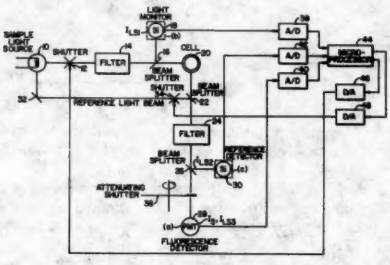
means for converting each said analog signal into a corresponding digital signal and for calculating the location of each corresponding induced electrical charge on said encoder surface based on the relative amplitude of each analog signal on respective row wires and column wires.

4,622,468

FLUORESCENCE INTENSITY COMPENSATION METHOD AND DEVICE

Andrew Stefanski, Menlo Park; Alfred H. Sturtevant, Palo Alto; Michael G. Konicek, Cupertino, and Peter E. Lobban, Palo Alto, all of Calif., assignors to Sequoia-Turner Corporation, Mountain View, Calif.

Filed Jul. 15, 1985, Ser. No. 754,659
Int. Cl.[4] G01N *21/64*
U.S. Cl. 250—458.1 **7 Claims**



1. In a method of fluorescence detection wherein a light source of a first predetermined wavelength is shone on a sample and the intensity (I_S) of the fluorescence from the sample at a second predetermined wavelength is detected by a detector a, the improvement comprising the steps of sensing the intensity (I_{LS1}) of the light source at the first predetermined wavelength by a detector b, sensing the intensity (I_{LS2}) of the light source at the second predetermined wavelength with a detector c, sensing the intensity (I_{LS3}) of the light source at the second predetermined wavelength with the detector a, and deriving a value F representing the fluorescence of the sample by combining the detected intensities according to the formula:

$$F = \frac{I_S \times I_{LS2}}{I_{LS3} \times I_{LS1}}$$

4,622,469

METHOD FOR DETECTING ROTTEN ALBUMEN AND APPARATUS THEREFOR

Hirokazu Akiyama, Zushi, Japan, assignor to Q. P. Corporation, Tokyo, Japan

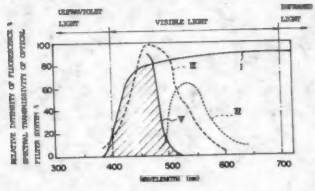
Filed Feb. 27, 1985, Ser. No. 706,425
Int. Cl.[4] G01N *21/64*
U.S. Cl. 250—458.1 **11 Claims**

1. An apparatus for detecting rotten albumen in raw egg, comprising:

means for casting ultraviolet light onto albumen to be inspected, the albumen may include yolk material;

means for filtering a complex of fluorescence received from the albumen and ultraviolet light reflected from or transmitted through the albumen, the filtering means transmitting only the fluorescence component from the albumen; and the filtering means further including an optical filter system having a first filter element and a second filter element, the first filter element being a tinted glass filter and the second filter element being an interference filter;

a photoelectric receiver working cooperatively with the filtering means for receiving the fluorescence of the albumen and outputting a corresponding electrical signal;



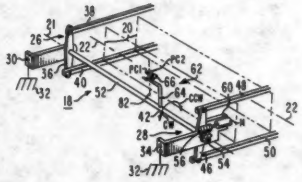
means connected electrically to the photoelectric receiver for comparing the outputted electrical signal with a reference signal, the outputted signal corresponding to the level of received fluorescence of albumen and the reference signal corresponding to a threshold level representing the fluorescence of sound albumen.

4,622,470

SHUTTER CONTROL SYSTEM

Junzo Makino, and Akira Yamada, both of Tokyo, Japan, assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 16, 1984, Ser. No. 600,820
Int. Cl.[4] G01J *1/20*; F24J *2/38*
U.S. Cl. 250—203 R **13 Claims**



1. A shutter light controlling system for use with a shutter having a plurality of light passing orientations in which the light to be controlled from a source is incident on and passes through the shutter, said shutter tending to pass said light to be controlled at different intensities according to the light passing orientation of the shutter relative to the source, said system comprising:

drive means adapted to place said shutter in a given light passing orientation in response to an applied drive input signal;

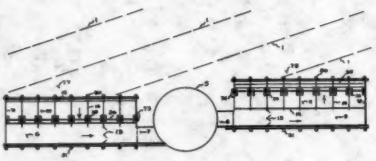
first control means responsive to the light to be controlled for generating a first drive means input signal to place the shutter in a first orientation at which the intensity of the light passed by said shutter is a maximum; and

second control means responsive to the intensity of the light passed by said shutter for generating a second drive means input signal for overriding said first input signal to place the shutter at a second orientation at which the intensity of light passed by said shutter is at any selected value less than said maximum.

4,622,471
OCEAN WAVE HYDRO-ELECTRIC GENERATOR FACILITY

Warren C. Schroeder, Suite C-603, Columbia Plz., 2400 Virginia Ave. NW., Washington, D.C. 20037

Filed Oct. 1, 1981, Ser. No. 307,498
Int. Cl.[4] F03B *13/12*
U.S. Cl. 290—42 68 Claims

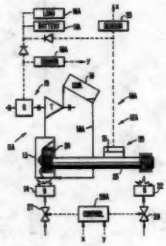


1. A plurality of unidirectional valved intake gate units essentially relatively horizontally disposed, operating independently and located upstream of an input penstock, and adapted to intercept waves and convert their kinetic energy to drive a turbine, said gate units each comprising a moveable gate that is essentially horizontally hinged and adapted to permit the incoming waves and associated kinetic forces to slide over the upper surfaces of each of said gates and into said penstock, said gates being provided with gate stops limiting both the upward and downward movement of said gates, and wherein said unidirectional valved intake gates are adapted to operate at high and low tidal conditions, and constructed so that the back pressure of the penstock thrusts the independent valve gates upward directing the remaining forward moving wave energy and its associated kinetic forces to higher elevations increasing the water level height in the penstock.

4,622,472
HYBRID ELECTRIC POWER GENERATING SYSTEM

Lucien Y. Bronicki, Rehovot, Israel, assignor to Ormat Turbines Ltd., Yavne, Israel

Filed Jul. 16, 1984, Ser. No. 631,051
Int. Cl.[4] F01K *23/04*
U.S. Cl. 290—52 17 Claims



1. A hybrid power system comprising:

(a) a first energy converter operating on a closed Rankine cycle and including a vapor generator for vaporizing an organic working fluid in response to heat furnished from a heat source associated with the vapor generator, a turbo-generator responsive to vaporized working fluid for generating electrical power, a condenser responsive to vapor exhausted from the turbo-generator for converting such vapor to a condensed liquid, and means for returning said liquid to the vapor generator;

(b) a second energy converter including a thermo-electric generator having a junction, a heat source for heating said junction whereby such thermo-electric generator generates electrical power;

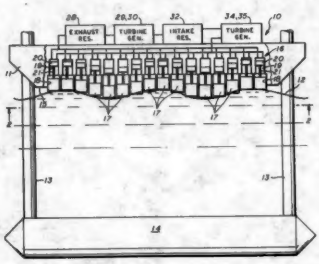
(c) a heat pipe for conveying heat from the heat source of said second converter to the vapor generator of said first converter and to said junction; and

(d) means for applying the electrical power generated by said first and second converters to an electrical load.

4,622,473
WAVE-ACTION POWER GENERATOR PLATFORM

Adolph Curry, 1306 Saw Mill Creek Rd., Sitka, Ak. 99835

Filed Jul. 16, 1984, Ser. No. 631,485
Int. Cl.[4] F03B *13/12*
U.S. Cl. 290—53 12 Claims



1. An apparatus adapted to be positioned in a body of water for generating electrical power from wave action therein, comprising

a platform having a deck and leg members extending in supporting relation thereto and adapted to suspend said deck above the water surface when installed in a body of water,

means to adjust the position of said deck above the wave-free surface of the water when said platform is installed in place, and

a power grid assembly disposed on the bottom surface of said deck including means for generating electrical power by pressurizing a fluid in response to the rise and fall of a wave passing therebelow,

said power grid comprising a plurality of weighted float members supported on and guided for vertical movement relative to said deck to contact the water surface at the wave-free level and provide independent reciprocal vertical movement in response to the rise and fall of the water surface by wave action,

said means for generating electrical power operated by both upward and downward vertical movement of said float members and comprising a plurality of piston members each positioned within a plurality of cylinders and each connected one to each of said float members at one end for direct operation thereby, a fluid contained in said cylinders acted upon by said pistons, and turbogenerator means operated by said fluid.

4,622,474
ALTERNATING-CURRENT FILTER CIRCUIT ARRANGEMENT

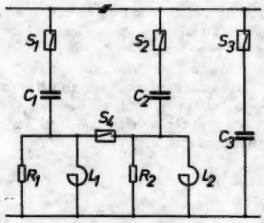
Norbert Christl, Turgi, Switzerland, and Kadry Sadek, Lauchringen, Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 10, 1984, Ser. No. 658,991
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1983, 3338629
Int. Cl.[4] H02J *1/02;* H02M *1/12*
U.S. Cl. 307—105 7 Claims

1. An alternating-current three-phase filter circuit arrangement for static converter systems comprising

(a) at least two parallel-connected high-pass filters, each filter being tuned to a different harmonic of the network frequency and including

(b) a filter choke connected in parallel with a damping resistor and



(c) a filter-circuit capacitor connected in series with a parallel choke and resistor connection

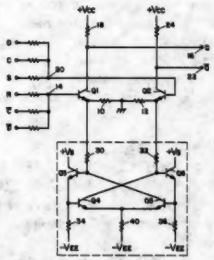
(d) and wherein a coupling switch is provided between the filter-circuit capacitor, damping resistor and filter choke of each of the high-pass filters.

4,622,475

DATA STORAGE ELEMENT HAVING INPUT AND OUTPUT PORTS ISOLATED FROM REGENERATIVE CIRCUIT

Stephen R. Whiteley, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 5, 1984, Ser. No. 585,948
Int. Cl.[4] H03K *3/287, 3/288*
U.S. Cl. 307—289 **2 Claims**



1. A data storage element, comprising:

a pair of input ports and a pair of output ports;

a data input pair of switching devices comprising first and second transistors, each having a base coupled to a respective input port, a collector coupled to a respective output port, and an emitter, said switching devices having two stable operating states and being responsive to at least one input binary signal for producing a pair of complementary output binary signals at said output ports; and

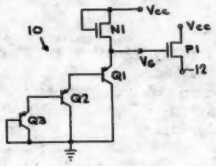
regenerative switching means comprising third and fourth transistors, each having a base coupled to a respective emitter of said first and second transistors, a collector cross-coupled to said respective emitters of said first and second transistors, and an emitter, the emitters of said third and fourth transistors being coupled together to form an emitter-coupled pair of transistors, and a current generator coupled to the emitters of said third and fourth transistors, said regenerative switching means also being responsive to said binary input signals for switching the operating states of said switching devices.

4,622,476

TEMPERATURE COMPENSATED ACTIVE RESISTOR

Bhimachar Venkatesh, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 29, 1985, Ser. No. 717,363
Int. Cl.[4] H03H *17/687;* H03K *3/26*
U.S. Cl. 307—310 **10 Claims**



1. A temperature compensated active resistor having a resistance value which remains substantially constant with temperature variations comprising:

a N-channel MOS transistor having its drain and gate electrodes connected to a supply potential;

a string of first, second and third bipolar transistors connected as a series of diodes in which all of the collectors of said bipolar transistors are connected together and to a ground potential;

said N-channel MOS transistor having its source electrode connected to the emitter of said first bipolar transistor, the base of said first bipolar transistor being connected to the emitter of said second bipolar transistor, the base of said second bipolar transistor being connected to the emitter of said third bipolar transistor, the base of said third bipolar transistor being connected to the ground potential; and

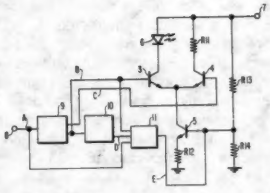
a P-channel MOS transistor having its source electrode connected to the supply potential, its gate electrode connected to the source electrode of said N-channel MOS transistor and its drain electrode connected to an output terminal, whereby the resistance value at the output terminal remains substantially constant over a relatively wide temperature range.

4,622,477

LIGHT EMITTING DIODE DRIVER CIRCUIT

Yoshihiro Uda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,451
Claims priority, application Japan, Nov. 24, 1983, 58-220967
Int. Cl.[4] H03K *19/14, 3/26;* G06G *7/12*
U.S. Cl. 307—311 **7 Claims**



1. A light emitting diode drive circuit comprising:

a differential amplifier having emitter coupled transistors, a collector of one of the emitter coupled transistors being connected to a light emitting diode;

a current source circuit connected to a common emitter of the emitter coupled transistors;

a first delay circuit responsive to an input signal for generating a first delay signal and an inverted signal in phase with the first delay signal;

a second delay circuit responsive to the first delay signal for producing a second delay signal; and

an OR circuit for providing the logical sum signal which

goes to a first level just before said first delay signal goes to said first level and which goes down to a second level just after said first delay signal goes down to the second level;

the first delay signal and the inverted signal associated therewith driving the emitter coupled transistors, the logical sum signal driving the current source circuit.

4,622,478

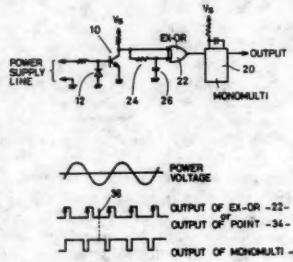
POWER FREQUENCY DETECTION SYSTEM

Masahiro Ise, Kashihara; Hidehiko Tanaka, Tenri; Katsuyuki Machino, Nara; Toshiyuki Matsubara, and Teiji Terasaka, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 454,622, Dec. 30, 1982. This application Jan. 2, 1986, Ser. No. 815,312

Int. Cl.[4] H03K *5/153, 5/00*

U.S. Cl. 307—354 **4 Claims**



1. A detection system for detecting a frequency of a power voltage applied thereto comprising:

zero-crossing detection means for detecting a zero-crossing of the power voltage and developing a detection signal when each zero-crossing is detected to form a detection signal train; and

inhibition means responsive to said detection signal train for inhibiting the output of said detection signal for a preselected period of time after an immediately preceding said detection signal has been developed to thereby prevent a detecting of a false zero-crossing resultant from noise, said inhibition means comprising,

means, responsive to said detection signal train, for delaying said detection signal train to form a delayed signal train,

an exclusive OR gate receiving said detection signal train at a first input thereof and receiving said delayed signal train at a second input thereof to produce a detected zero-crossing pulse train, and

a monostable multivibrator receiving said detected zero-crossing pulse train at its input and developing a true zero crossing output as an output of said inhibition means, said multivibrator having a pulse generating period slightly less than an expected period between adjacent zero-crossings of said power voltage.

4,622,479

BOOTSTRAPPED DRIVER CIRCUIT FOR HIGH SPEED APPLICATIONS

Ronald T. Taylor, Dallas, Tex., assignor to Thomson Components-Mostek Corporation, Carrollton, Tex.

Continuation of Ser. No. 449,792, Dec. 14, 1982. This application Aug. 29, 1985, Ser. No. 770,367

Int. Cl.[4] H03K *4/58, 19/017, 17/04, 19/096*

U.S. Cl. 307—482 **2 Claims**

1. An integrated circuit comprising first, second, third, and fourth transistors, each having a pair of current-carrying electrodes and a gate electrode for controlling the current flow between the two current-carrying electrodes,

means forming a first bus of high potential and a second bus of low potential,

the first and second transistors being serially connected between said first bus and said second bus,

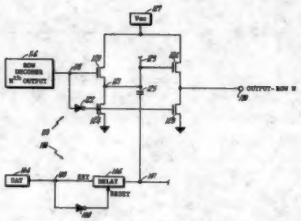
the third and fourth transistors also being serially connected between the first bus and the second bus,

an input logic circuit having an output node which in operation is normally low,

means for supplying the output of the logic circuit to the gate of the first transistor and the inverse of said output to the gates of said second and fourth transistors,

the node between the first and second transistors being connected to the gate of the third transistor,

an output terminal,



the node between the third and fourth transistors being connected to the output terminal,

bootstrapping capacitor means having first and second terminals, of which the first is connected to the node between the first and second transistors and to the gate of the third transistor,

delay means having an output node which is normally high in operation and which is connected to the second terminal of the bootstrapping capacitor means and receives an input signal ahead of the output of the input logic circuit for maintaining its output node low for a predetermined period of time and then returning high whereby a bootstrapping pulse is applied to the bootstrapping means.

4,622,480

SWITCHED CAPACITOR CIRCUIT WITH HIGH POWER SUPPLY PROJECTION RATIO

Kuniharu Uchimura, and Atushi Iwata, both of Saitama, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,523

Claims priority, application Japan, Apr. 26, 1982, 57-69821

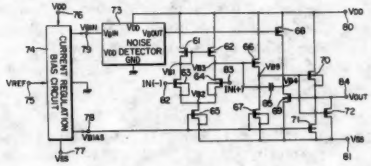
Int. Cl.[4] G05F *5/00*

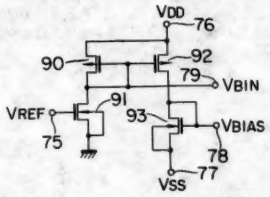
U.S. Cl. 307—491 **17 Claims**

1. A switched capacitor circuit having an integrating capacitor; an operational amplifier having an output end and an inverting input end between which said integrating capacitor is connected; a sampling circuit having an analog switch and a sampling capacitor, said sampling circuit being connected between a signal input end and said inverting input end of said operational amplifier; and a switch control circuit for controlling said analog switch, said switched capacitor circuit comprising:

a current regulation bias circuit for supplying a bias voltage to a constant current circuit so as to determine the operating current of a differential stage of said operational amplifier in accordance with a stable reference voltage applied to said bias circuit which is substantially free from the influence of a variation in a power supply voltage supplied to said switched capacitor circuit so that the operating current of said differential stage is free from the influence of the variation in the power supply voltage, said operational amplifier including a gain stage after said differential stage, said current regulation bias circuit comprising: a

first MOS transistor which receives the reference voltage at a gate-source path thereof; a second MOS transistor connected in series with said first MOS transistor; a third MOS transistor, the drain and gate of which are respectively connected to the drain and gate of said second MOS transistor, said third MOS transistor constituting a current mirror circuit together with said second MOS transistor; and a fourth transistor connected in series with said third





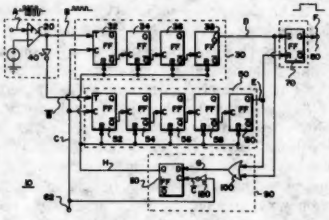
MOS transistor so as to have a constant gate-source voltage which is substantially free from the influence of the variation in the power supply voltage due to supply of constant current from said current mirror circuit, wherein the gate and source of said fourth transistor are connected to the gate and source, respectively, of a MOS transistor of said constant current circuit for determining the operating current of said operational amplifier.

4,622,481

DIGITAL ENVELOPE DETECTION CIRCUIT

Kevin E. Nortrup, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 21, 1985, Ser. No. 768,079
Int. Cl.[4] H03D *3/00*
U.S. Cl. 307—522 **12 Claims**



1. Digital signal processing apparatus for detecting the presence of a carrier signal occurring at a given frequency; said signal processing apparatus comprising:

a source of a pulsed clock signal occurring at a rate which is a multiple of said carrier signal frequency;

first means for counting said clock pulses when said carrier signal is "high"; said first counting means having an upper limit;

second means for counting said clock pulses when said carrier signal is "low"; said second counting means having a different upper limit;

means responsive to said first and second counting means for generating a signal representative of the envelope of said carrier signal; said envelope generating means producing a first and a second output depending upon whether said first or said second counting means first reaches its respective upper limit; and

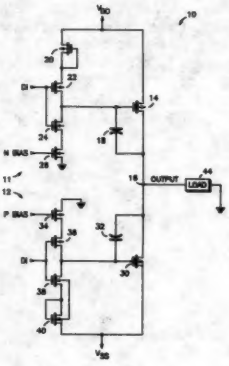
means for resetting both of said counting means to zero whenever either one of said counting means reaches its respective upper limit.

4,622,482

SLEW RATE LIMITED DRIVER CIRCUIT WHICH MINIMIZES CROSSOVER DISTORTION

Jeffrey D. Ganger, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 30, 1985, Ser. No. 771,526
Int. Cl.[4] H03K *17/687*
U.S. Cl. 307—585 **10 Claims**



8. A method of slew rate limiting a driver circuit to provide an output signal to a load coupled to an output terminal thereof, said output signal having a predetermined amount of slew rate, comprising the steps of:

coupling current conducting electrodes of a pair of driver transistors of complementary conductivity type in series between first and second power supply terminals, wherein the output terminal is between the driver transistors;

referencing the load to a predetermined reference potential having a value between first and second power supply voltages; and

coupling a first electrode of each of first and second capactiros to the output terminal and selectively coupling a second electrode of each of said capacitors via switched impedance means to a predetermined one of the first or second power supply voltages or to the reference potential, for respectively slew rate limiting the output voltage for positive and negative transitioning output signals.

4,622,483

PIEZOELECTRIC ELECTROMECHANICAL TRANSLATION APPARATUS AND METHOD

Charles W. Staufenberg, Jr., 575 Sycamore Vista Rd., Santa Barbara, Calif. 93108, and Robert J. Hubbell, 3950 Carol Ave., Santa Barbara, Calif. 93105

Continuation-in-part of Ser. No. 478,253, Mar. 24, 1983, abandoned. This application Mar. 4, 1985, Ser. No. 707,966
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 **36 Claims**

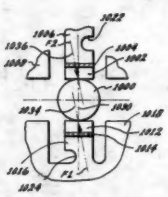
1. An electromechanical translation apparatus adapted for

use with a substantially incompressible member having a relatively smooth exterior outer surface to produce incremental relative movement therebetween comprising

a housing adapted to be positioned adjacent a said member;

a first engaging element located within said housing, said first engaging element having a first end and a second end which is located in a spaced opposed relationship to said first end and wherein said first end has an outer surface formed into a predetermined shape which is adapted to selectively clamp a said member at a selected location on its said outer surface in response to a clamping force of a first magnitude and to be incrementally translated with a said member and which is responsive to a clamping force of a second magnitude to be slidable relative to a said member's outer surface, said first engaging element being formed of a material which is capable of transmitting a driving force applied to said second end through said first engaging element and to said first end as a clamping force which is applied onto said selected location on a said member's outer surface;

a first piezoelectric driving element which is operatively coupled to said second end of said first engaging element and operatively coupled to aid housing, said first piezoelectric driving element being capable of being selectively expanded and contracted in response to a voltage of a selected magnitude and a selected frequency being applied thereto to produce between said housing and said first engaging element a driving force which in magnitude between a first magnitude and a second magnitude and which is adapted to be conducted through said first engaging member to said first end to be applied as a variable clamping force on a selected location of a said member's outer surface and wherein the clamping force thereon varies between a first magnitude and a second magnitude;



a second engaging element located within said housing at a different location relative to that of said first engaging element, said second engaging element having a first end which is located in a spaced opposed relationship to said first end and wherein said first end has an outer surface formed into a predetermined shape which is adapted to selectively clamp a said member at a different selected location on its said outer surface in response to a clamping force of a second magnitude to be slidable relative to a said member's outer surface, said second engaging element being formed of a material which is capable of transmitting a driving force applied to said second end through said second engaging element and to said first end as a clamping force which is applied onto said different location on a said member's outer surface;

a second piezoelectric driving element which is operatively coupled to said second end of said second engaging elemcnt and operatively coupled to said housing, said second piezoelectric driving element being capable of being selectively expanded and contracted in response to a voltage of a selected magnitude and a selected frequency being applied thereto to produce between said housing and said second engaging member a driving force which varies in magnitude between a first magnitude and a second magnitude and which is adapted to be conducted through said second engaging member to said first end to be applied as a variable clamping force on a different selected location of said member's outer surface wherein the clamping force thereon varies between a first magnitude and a second magnitude; and

compliance means operatively coupled to the housing for urging the first and second engaging elements and the first and second piezoelectric driving elements toward a said member and for holding said engaging elements in contact with a said member;

said first engaging element and said second engaging element being responsive to the selective expansion and contraction of said first piezoelectric driving element and said second pizeoelectric driving element to clamp and translate said housing in a selected direction relative to a said member.

4,622,484

PIEZOELECTRIC RELAY WITH A PIEZOELECTRIC LONGITUDINAL EFFECT ACTUATOR

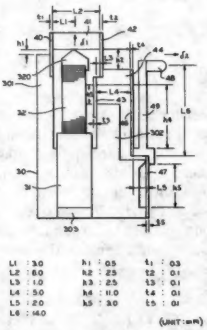
Naoto Okihara; Yoshiki Aihara, and Kazutoshi Wakamatsu, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,622

Claims priority, application Japan, Jun. 21, 1984, 59-128992; Jul. 5, 1984, 59-101703[U]; Jul. 27, 1984, 59-114568[U]; Oct. 24, 1984, 59-223224; Feb. 6, 1985, 60-15710[U]

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—328 **6 Claims**



L1 : 3.0	h1 : 0.5	t1 : 0.3
L2 : 8.0	h2 : 2.5	t2 : 0.1
L3 : 1.0	h3 : 2.5	t3 : 0.1
L4 : 5.0	h4 : 11.0	t4 : 0.1
L5 : 2.0	h5 : 3.0	t5 : 0.1
L6 : 14.0		

(UNIT : mm)

1. A piezoelectric relay comprising:

a base frame made of synthetic resin and having a base plate;

a first block having a first arm and a second arm extending in parallel with each other, and a connection channel fixed on said base plate for inter-connecting said arms;

a second block engaged with said connection channel of said first block;

an elongated piezoelectric actuator having one end portion abutting against said second block and extending in the axial direction thereof, said actuator having a driving chip on its other end portion thereof, said actuator being arranged between said first arm and said second arm of said first block, and being expansion-displaced in said axial direction in response to applied voltage;

displacement magnifying means having an input section for receiving as an input the displacement from said actuator, and a first-stage magnifying section and a second-stage magnifying section for sequentially magnifying the output displacement of said input section; said input section of said displacement magnifying means comprising a first resilient lever having one end which is fixed to said first arm of said first block, a first non-resilient lever which is fixed at one end portion thereof to the other end portion of said resilient lever, said first non-resilient lever abutting against said driving chip of said actuator at substantially a center portion thereof; said first-stage magnifying section

comprising a second resilient lever which is fixed at one end portion thereof to the other end portion of said first non-resilient lever, a third resilient lever which is fixed at one end portion thereof to said second arm of said first block, a second non-resilient lever which is fixed at one end portion thereof to the other end portion of said second and third resilient levers; said second-stage magnifying section comprising a fourth resilient lever which is fixed at one end portion thereof to the other end portion of said second non-resilient lever, a fifth resilient lever which is fixed at one end portion thereof to the other end portion of said second arm, said second arm of said first block having a stopper which abuts on at least one of said fourth and fifth resilient levers of said magnifying means, a third non-resilient lever which is fixed at one end portion thereof to the other end portion of said fourth and fifth resilient levers; and

a movable resilient member driven by said magnifying means to connect between a movable contact and a stationary contact;

wherein $\Delta l_2 = \Delta l_3 - \Delta l_1$ is satisfied where the dimensional variations caused by the temperature variation among said actuator, said first block, and said second block are $-\Delta l_1$, Δl_2, and Δl_3, respectively.

4,622,485

DISCHARGE LAMP WITH NEON GAS IN OUTER TUBE

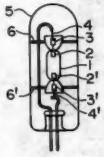
Tsune Miyashita, Tokyo; Makoto Yasuda; Seiichi Murayama, both of Kokubunji, and Yoji Arai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 699,687

Claims priority, application Japan, Feb. 14, 1984, 59-24323

Int. Cl.[4] H01J *61/30, 61/16*

U.S. Cl. 313—25 **10 Claims**



1. A discharge lamp comprising an inner tube and an outer tube enclosing said inner tube, wherein said outer tube is filled with neon gas only at a pressure of 0.1 atm or more, or a gas mixture of neon in 80 pressure percent or more and a breakdown suppressing gas, so as to suppress any rise in temperature of the inner tube during operation of the lamp while preventing discharge in the outer tube.

4,622,486

HALOGEN LAMP DEVICE FOR HEADLAMP

Ariyoshi Endo, Atsugi, Japan, assignor to Ichikoh Industries, Limited, Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,454

Claims priority, application Japan, Oct. 31, 1983, 58-202796; May 31, 1984, 59-109440

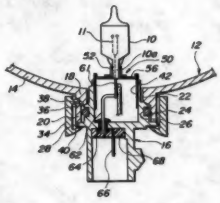
Int. Cl.[4] H01K *1/28, 1/42*

U.S. Cl. 313—115 **7 Claims**

1. A halogen lamp device for a headlamp having an airtightly sealed lamp enclosure including a light beam passing lens, a reflector for guiding the light beam and a socket opening provided in the reflector, and a holder made of synthetic resin in which a halogen bulb having filaments inserted through the socket opening of the lamp enclosure and sealed is mounted, comprising:

a metallic sleeve member engaged with said holder, and

a metallic bulb support formed to have a supporting portion for fixedly supporting the halogen bulb in engagement with the outer peripheral surface of a pinch-seal portion of said halogen bulb and a flange including at least one projection wall integrally formed with the supporting portion and extended in parallel along the inner wall of said sleeve member,



said sleeve member and said bulb support being constructed to move relative to each other, said halogen bulb being adjusted by said relative movement so that said bulb is disposed at a predetermined position in said enclosure, the projecting wall of said support being welded to said sleeve member after said adjustment.

4,622,487

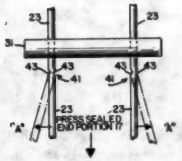
ELECTRIC LAMP WITH STRESS RELIEVING MEANS

Arnold E. Westlund, Jr., and Freddie P. Hughes, both of Winchester, Ky., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 9, 1985, Ser. No. 690,079

Int. Cl.[4] H01J *1/88, 19/42;* **H01K** *1/18*

U.S. Cl. 313—273 **8 Claims**



1. In an electric lamp having a glass envelope including a press-sealed end portion, a filament structure located within said envelope and including at least one coiled filament and a pair of support wires, and a glass bridge located within said envelope adjacent said press-sealed end portion, said support wires providing support for said coiled filament within said envelope and passing through said glass bridge and into said press-sealed end portion, the improvement comprising:

means for permitting outward lateral movement of at least one of said support wires relative to said glass bridge during formation of said press-sealed end portion to thereby substantially prevent breakage of said glass bridge during said formation.

4,622,488
INTERNALLY FUSED ELECTRIC LAMP WITH PARTIALLY EMBEDDED FUSE WIRE

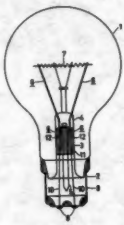
Johannes H. H. Beurskens, and Bauke J. Roelevink, both of Weert, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 21, 1984, Ser. No. 623,047

Claims priority, application Netherlands, Jun. 29, 1983, 8302306

Int. Cl.⁴ H01J *5/62, 5/50*

U.S. Cl. 313—318 **9 Claims**



1. An internally fused electric lamp comprising:
a lamp vessel enclosing an inner space, and having a tube extending inwardly, said vessel being sealed in a vacuum-tight manner by means including a pinch at an end of the tube inside the vessel,
a light source arranged in said space,
a lamp cap having electrical contacts, secured to the vessel, and arranged such that the tube communicates with the cap,
two current supply conductors, each extending from a respective contact through said tube and pinch to said light source, a portion of at least one of said conductors consisting of a fuse wire, and
a mass of electrically insulating material through which said fuse wire passes,
characterized in that said mass is disposed in said tube adjacent said pinch,
a first portion of said fuse wire is embedded in said mass, and a second portion of said fuse wire is free of said mass and is between said mass and the respective contact, and
said insulating mass is formed of a material which is coherent at temperatures occurring in the mass during normal operation of the lamp.

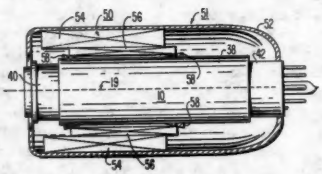
4,622,489
IMAGE PICKUP TUBE ASSEMBLY WITH MOUNTED COIL ASSEMBLY

Louis D. Miller, Leola, Pa., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 192,361, Sep. 30, 1980, Pat. No. 4,558,251. This application Jul. 19, 1985, Ser. No. 756,838

Int. Cl.⁴ H01J *31/26;* **H01F** *1/00*

U.S. Cl. 313—365 **2 Claims**



1. An image pickup assembly comprising:
an image pickup tube having an evacuated tubular envelope with a centrally disposed longitudinally extending optical axis, said tubular envelope having a precisely formed inside surface of substantially constant inside diameter extending along the length of said envelope, said envelope having a central support portion, a faceplate sealing portion at one end and a stem sealing portion at the other end, said central support portion having a precisely formed outside surface that is coaxial with said inside surface to a tolerance of at least 0.0254 mm, said outside surface having a diameter greater than the outside diameter of said sealing portions, the midpoint of said central support portion outside diameter lying on said optical axis of said tube,
a coil assembly coaxially disposed around said tube, said coil assembly having an inside diameter that is less than about 0.0254 mm larger than the outside diameter of said center support portion thereby closely conforming to said central support portion of said envelope of said tube, whereby said tube is substantially self-centered within said coil assembly, and
means for securing said tube within said coil assembly.

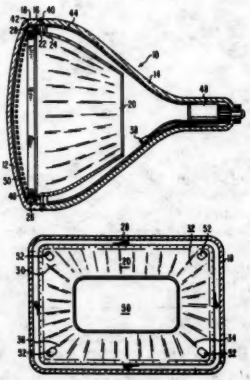
4,622,490
CATHODE-RAY TUBE WITH AN INTERNAL MAGNETIC SHIELD

Robert E. Benway, Marion, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1985, Ser. No. 706,407

Int. Cl.⁴ H01J *29/06, 29/94*

U.S. Cl. 313—402 **7 Claims**



1. In a cathode-ray tube having a rectangular faceplate panel sealed to a funnel thereof along an edge of a sidewall of said panel, and having an internal magnetic shield with a plurality of corners disposed therein proximate an inner surface of said sidewall adjacent the edge thereof and extending backward along an inner surface of said funnel adjacent said edge, said tube including means disposed therein for depositing getter material within said tube, the improvement comprising said internal magnetic shield having aperture means disposed in at least one corner thereof for allowing dispersal of said getter material therethrough and onto the inner surfaces of said sidewall and said funnel adjacent said edge, the total area of said aperture means being less than twenty percent of the peripheral surface area of said shield adjacent said inner surfaces.

4,622,491

ELECTRON GUN FOR COLOR PICTURE TUBE WITH ELECTROSTATIC FOCUSSING LENS

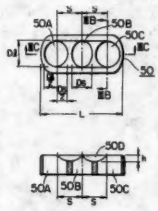
Yukihiro Izumida; Kazuo Majima, both of Mobara; Hidemasa Komoro, Chiba; Masakatsu Horiuchi, and Mamoru Ikeda, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,492

Claims priority, application Japan, May 18, 1983, 58-85709

Int. Cl.[4] H01J *29/62*

U.S. Cl. 313—414 **9 Claims**



1. An electron gun for a color picture tube comprising:

means for generating three electron beams along a tube axis of said picture tube;

a first electrode having three electron beam passing holes arranged in line in a direction orthogonal to said tube axis; and

a second electrode arranged to oppose said first electrode with a predetermined distance therebetween and having three electron beam passing holes arranged to oppose said electron beam passing holes of said first electrode, said first and second electrodes forming main electrostatic focusing lenses between said respective opposed electron beam passing holes of said first and second electrodes when applied with predetermined potentials, respectively;

wherein each of said first and second electrodes is formed of an oval thick plate; said in line electron beam passing holes of each electrode including two side or outer electron beam passing holes each having an outer half in the form of a semi-circle and a remaining half in the form of a semi-ellipse having a diameter of said semi-circle as its major axis, as viewed along said tube axis, and a central electron beam passing hole in the form of an ellipse having a major axis which is equal to the diameter of said semi-circle and which extends in a direction orthogonal to the direction of arrangement of said electron beam passing holes, as viewed along said tube axis; and at least one of opposed surfaces of said first and second electrodes is formed with a recess between the center of each of said outer electron beam passing holes and the center of said central electron beam passing hole except for a peripheral edge of said surface, said recess having a predetermined depth whereby the distance between said first and second electrodes at ends of the minor axis is wider that that distance at ends of the major axis of the elliptical portions of said electron beam passing holes.

4,622,492

PICTURE DISPLAY PANEL

Piet G. J. Barten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1984, Ser. No. 644,823

Claims priority, application Netherlands, Aug. 25, 1983, 8302966

Int. Cl.[4] H01J *29/02*

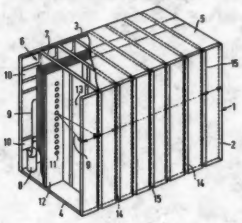
U.S. Cl. 313—422 **3 Claims**

1. A display panel comprising

an envelope having a display window,

a plurality of separated reinforcement partitions extending transversely to said display window, said reinforcement partitions being within said envelope, and

a plurality of V-shaped grooves on an exterior surface of said



display window with one of said plurality of V-shaped grooves being opposite to each of said plurality of separated reinforcement partitions to therefore render reinforcement partitions invisible.

4,622,493

HIGH INTENSITY ULTRAVIOLET LIGHT SOURCE

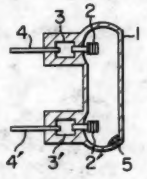
Makoto Yasuda, and Seiichi Murayama, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 22, 1983, Ser. No. 477,620

Claims priority, application Japan, Apr. 7, 1982, 57-56606

Int. Cl.[4] H01J *61/20*

U.S. Cl. 313—642 **9 Claims**



1. A high intensity ultraviolet light-source comprising mercury, tantalum halide and rare gas filled in an arc tube having a pair of main electrodes, wherein the quantity of said tantalum halide filled in said arc tube is less than or equal to 20% in molar ratio with respect to the quantity of mercury, said mercury and said tantalum halide radiating ultraviolet rays to thereby provide the ultraviolet light, and wherein said light-source has a tube loading of at least 13 Watt/cm^2, to thereby provide a light-source having a sufficiently high radiance at wavelengths of at least 190–245 nm for said light-source to be a source of light at wavelengths of 190–450 nm, including said at least 190–245 nm.

4,622,494

SIGNALLING DEVICE

Robert M. Johnson, 4071 Sunnyslope Rd. SW., Port Orchard, Wash. 98366

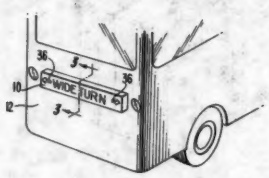
Filed Feb. 19, 1986, Ser. No. 830,987

Int. Cl.[4] B60Q *1/26*

U.S. Cl. 315—77 **17 Claims**

1. An auxiliary signalling and warning device for utilization on vehicles which negotiate wide turns comprising a generally rectangular main body section having upper and lower walls, a pair of side walls, and a front and rear portion, said front portion being formed by a plurality of inwardly bent front flanges; at least one of the inner surfaces of said main body section being reflectorized; light bulb retaining means adapted to be provided within said main body section; a rectangular

light lens member; said light lens member being provided with a written message; said written message indicating that the vehicle negotiates wide turns; said light lens member being adapted to be secured to said front portion of said main body section; said light lens member and said main body section together defining an enclosure; a rectangular front gasket



adapted to be disposed between said light lens member and said front portion and securing means provided on said rear portion for mounting said enclosure onto the rear of a vehicle required to negotiate wide turns; said enclosure being adapted to be illuminated upon actuation of said vehicle's directional signal; said illumination flashing on and off in conjunction with said vehicle's directional signal.

4,622,495

ELECTRODELESS DISCHARGE LAMP WITH RAPID LIGHT BUILD-UP

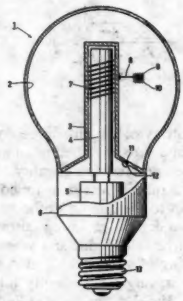
Theodorus J. H. Smeelen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1984, Ser. No. 587,792

Claims priority, application Netherlands, Mar. 23, 1983, 8301032

Int. Cl.[4] H05B *41/16, 41/24*

U.S. Cl. 315—248 **11 Claims**



1. An electrodeless discharge lamp, comprising:

a lamp vessel, sealed in a vacuum-tight manner, and containing a filling of mercury and a rare gas,

a core of magnetic material, and a coil wound around the core, for inducing a high-frequency magnetic field in the core upon energization by an electric supply unit, so as to produce an electric discharge within the lamp envelope, and

a holder containing an amalgam, disposed within the lamp vessel,

characterized in that the holder is disposed within the vessel at a location at a given distance outward from the core and from the wall, where the discharge is produced by the high-frequency magnetic field, such that the holder is located in the discharge and the amalgam is heated directly by the discharge, and

the amalgam is selected such that during operation of the lamp the holder contains essentially only amalgam-producing metal, and is substantially free of mercury.

4,622,496

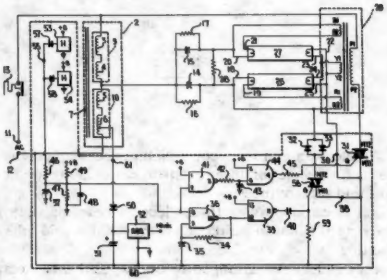
ENERGY EFFICIENT REACTANCE BALLAST WITH ELECTRONIC START CIRCUIT FOR THE OPERATION OF FLUORESCENT LAMPS OF VARIOUS WATTAGES AT STANDARD LEVELS OF LIGHT OUTPUT AS WELL AS AT INCREASED LEVELS OF LIGHT OUTPUT

Donald P. Dattilo, Louisville, Ky., and Michael S. Knippert, Grants Pass, Oreg., assignors to Energy Technologies Corp., Grants Pass, Oreg.

Filed Dec. 13, 1985, Ser. No. 808,468

Int. Cl.[4] H05B *41/16*

U.S. Cl. 315—283 **15 Claims**



1. A reactance ballast and control unit for use in connecting at least one electric discharge lamp having at least two filaments to a power source, said unit comprising:

(A) input means for connecting to said power source;

(B) output means for connecting to said at least one electric discharge lamp;

(C) heater means for supplying heater voltage to said at least two filaments;

(D) inductor means operably connected between said input means and said output means for providing operating current to said at least one electric discharge lamp; and

(E) Hall effect switch means responsive to said inductor means for inhibiting said heater means from supplying heater voltage to said at least two filaments when sufficient current flows through said inductor means to create a sufficient magnetic field to switch said Hall effect switch means.

4,622,497

FLAT TYPE CATHODE RAY TUBE

Hiroshi Miyama, Yokohama; Yoshikazu Kawauchi, Kawasaki; Kaoru Tomii, Isehara, and Jun Nishida, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 6, 1985, Ser. No. 708,898

Claims priority, application Japan, Mar. 9, 1984, 59-45830; Mar. 14, 1984, 59-49515; Mar. 14, 1984, 59-49524; Mar. 14, 1984, 59-49525; Mar. 14, 1984, 59-49526

Int. Cl.[4] H01J *29/70, 29/72*

U.S. Cl. 315—366 **26 Claims**

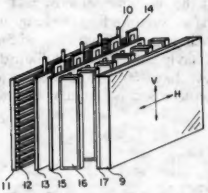
1. A flat type cathode ray tube comprising:

a face plate;

one or more linear thermal cathodes for emitting electron beams, said linear thermal cathodes extending vertically in a vacuum enclosure and being arranged parallel to said face plate;

a plurality of electrically isolated vertical scanning electrodes disposed on one side of and extending perpendicularly to said linear thermal cathodes;

a plurality of planar electrodes each having electron beam transmission apertures formed therein at positions corresponding to said linear thermal cathodes and arranged on another side of said linear thermal cathodes opposite to said one side of said linear thermal cathodes at which said vertical scanning electrodes are disposed;



horizontal deflection electrodes for horizontally deflecting said electron beams emitted by said linear thermal cathodes; and

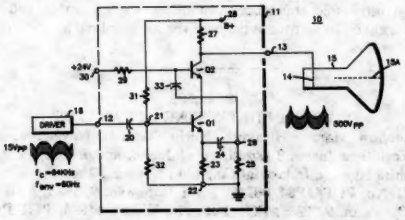
a light emitting layer formed on a surface of said face plate which faces said linear thermal cathodes, said light emitting layer for emitting light beams responsive to stimulation thereof by said electron beams impinging thereon.

4,622,498

DYNAMIC FOCUS SYSTEM CASCODE AMPLIFIER

Theodore V. Lester, Schiller Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 3, 1985, Ser. No. 771,947
Int. Cl.[4] H01J *29/58*
U.S. Cl. 315—382 **10 Claims**



1. A dynamic focus amplifier system comprising:

a cascode amplifier including first and second transistors, each having a control electrode and a pair of main current carrying electrodes forming a main current carrying path for each transistor, the main current carrying paths of each of said transistors connected in series and connected in series between first and second power supply terminals;

an input terminal coupled to said control electrode of said first transistor, and an output terminal connected to one of said main current carrying electrodes of said second transistor, said first and second transistors forming a cascode amplifier means for together amplifying input signals having frequencies substantially above 16 KHz applied at said input terminal and providing said amplified input signals as high voltage peak-to-peak output signals at said output terminal;

means directly coupling said output terminal and said output signals to a focus electrode of a cathode ray tube;

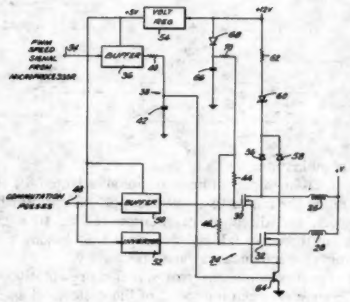
wherein the improvement comprises signal coupling means for coupling AC signals corresponding to noninverting AC input signals provided at the control electrode of said first transistor to the control electrode of said second transistor, whereby a smaller phase shift for said cascode amplifier means is achieved.

4,622,499

METHOD AND APPARATUS FOR CONTROLLING A MOTOR

John P. Squires, Jamestown; Alan D. Kronisch; John J. Freeman, both of Longmont, and James J. Touchton, Boulder, all of Colo., assignors to MiniScribe Corporation, Longmont, Colo.

Filed Feb. 27, 1985, Ser. No. 706,147
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **33 Claims**



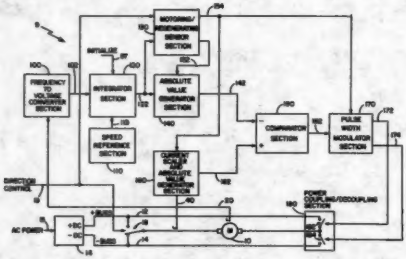
1. A method of driving an n-phase DC motor, where $n>1$, comprising the steps of operating a central processing unit (CPU) to generate a motor speed command signal in accordance with a predetermined programmed set of instructions; converting said motor speed command signal to a motor drive signal; selecting a respective phase of said DC motor to be energized; applying DC power to the selected phase as a function of said motor drive signal; supplying to said CPU signals representing the position or speed of said DC motor; operating said CPU to detect both rapidly changing and slowly changing errors in the actual speed of said DC motor; operating said CPU in accordance with a first set of instructions to modify said motor speed command signal by an amount tending to reduce rapidly changing detected speed errors; and operating said CPU in accordance with a second set of instructions to modify said motor speed command signal by an amount tending to reduce detected slowly changing speed errors.

16. A method of driving an n-phase DC motor, where $n>1$, comprising the steps of operating a central processing unit (CPU) to generate a motor speed command signal in accordance with a predetermined programmed set of instructions; converting said motor speed command signal to a motor drive signal; selecting a respective phase of said DC motor to be energized; applying DC power to the selected phase as a function of said motor drive signal; supplying to said CPU signals representing the position or speed of said DC motor; operating said CPU to detect errors in the actual speed of said DC motor; operating said CPU to modify said motor speed command signal by an amount tending to reduce detected speed errors; and braking said DC motor when electrical power is interrupted, including storing a DC voltage level during the time period that power is applied, and using said stored DC voltage level to turn on phase selecting FET devices and shunt all of the n phases of said DC motor to a reference potential through said FET devices when said electrical power is interrupted.

4,622,500
ELECTRIC MOTOR CONTROLLER

Frederick T. Budelman, Jr., Elk Grove, Ill., assignor to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Jul. 11, 1985, Ser. No. 754,057
Int. Cl.[4] H02P 7/06
U.S. Cl. 318—341 6 Claims



1. In combination:

a motor having a pair of input terminals adapted for serially coupling the motor to a power supply, said motor having a speed and direction of rotation related to a current passing therethrough and driving a load having a predetermined mechanical resonant frequency;

means for producing an error signal representative of the difference between the speed of the motor and a selected motor speed;

a first switch disposed in series between the power supply and one of the pair of input terminals of the motor, the first switch being responsive to a first control signal;

a second switch connected in parallel across the pair of input terminals of the motor, the second switch being responsive to a second control signal;

means, responsive to the speed error signal and a signal representative of the motor current, for producing a pulse train having a nominal frequency and duty cycle, such nominal frequency being substantially higher than the mechanical resonant frequency, and for modulating said duty cycle in accordance with the difference between the speed error signal and the signal representative of the motor current; and

means for controlling the speed fo the motor at a frequency substantially higher than the mechanical resonant frequency of the load, said speed controlling means comprising means for coupling said modulated pulse train to the first switch as the first control signal when the rotational speed of the motor is less than the selected speed to increase the motor speed, and for alternately coupling said modulated pulse train to the second switch as the second control signal when the rotational speed of the motor exceeds the selected speed to decrease the speed of the motor.

4,622,501
ULTRASONIC SECTOR SCANNER

Arnold T. Eventoff, Pleasantville, and Fred R. Stolfi, Shrub Oak, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

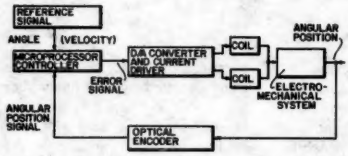
Filed May 10, 1985, Ser. No. 732,339
Int. Cl.[4] A61B 10/00; G05G 5/00
U.S. Cl. 318—627 16 Claims

1. An ultrasonic sector scanner comprising:

a first stator having a magnetic permeability greater than that of air, said first stator having two end faces opposite each other with a gap therebetween, said end faces being arranged on opposite sides of a longitudinal axis;

a second stator having a magnetic permeability greater than that of air, said second stator having two end faces opposite each other with a gap therebetween, said end faces being arranged on opposite sides of the longitudinal axis, the second stator being spaced from the first stator in the longitudinal direction;

a first rotor having a magnetic permeability greater than that off air arranged on the longitudinal axis between the end faces of the first stator, said first rotor arranged to be rotatable about the longitudinal axis, said first rotor having an outer surface surrounding the longitudinal axis, said outer surface being spaced from the end faces of the first stator by gaps having thicknesses which decrease as the rotor rotates less than 360° in a first direction from a first angular position to a second angular position;



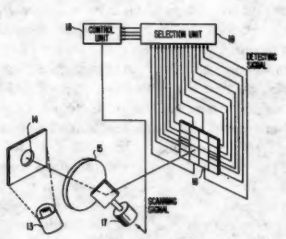
a second rotor having a magnetic permeability greater than that of air arranged on the longitudinal axis between the end faces of the second stator, said second rotor connected to the first rotor and arranged to be rotatable about the longitudinal axis with the first rotor, said second rotor having an outer surface surrounding the longitudinal axis, said outer surface being spaced from the end faces of the second stator by gaps having thicknesses which decrease as the rotors rotate less than 360° in a second direction opposite to the first direction from the second angular position to the first angular position; and

an ultrasonic transducer connected to the rotors and arranged to be rotatable about the longitudinal axis with the rotors.

4,622,502
POSITION DETECTING APPARATUS

Tomohiro Maruo, Hirakata; Norio Okutani, Neyagawa, and Toshitugu Inoue, Tsuzuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP84/00210, § 371 Date Jan. 9, 1985, § 102(e) Date Jan. 9, 1985, PCT Pub. No. WO84/04586, PCT Pub. Date Nov. 22, 1984
PCT Filed Apr. 23, 1984, Ser. No. 694,557
Claims priority, application Japan, May 17, 1983, 58-87009; May 17, 1983, 58-87011; Jul. 5, 1983, 58-123060
Int. Cl.[4] G05B 1/06
U.S. Cl. 318—640 8 Claims



1. A position detecting apparatus comprising: a lighting unit for lighting an object to be detected; an image-formation unit for imaging said object to be detected; a detecting unit comprising a plurality of photoelectric converters disposed on an image-formation plane to detect brightness of said image and disposed two-dimensionally; a scanning unit for allowing the

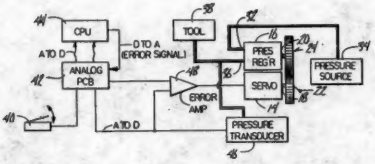
relative position of each of said photoelectric converters with respect to said image to move one-directionally in said image-formation plane; a selecting unit for selecting a plurality of detected signals from said detecting unit, and a decision means for determining the one- and two-dimensional positions of the center, corner and edge of said object in accordance with a detecting signal from said detecting unit, a selecting signal from said selecting unit and a scanning signal from said scanning unit.

4,622,503

VARIABLE PNEUMATIC OUTPUT MEANS FOR USE WITH OPHTHALMIC MICRO-SURGICAL INSTRUMENTS

Leif J. Sundblom, Castro Valley; Daniel D. Rogers, Berkeley, and Wayne W. Rogers, Napa, all of Calif., assignors to Medical Instrument Development Laboratories, Inc., San Leandro, Calif.

Filed Sep. 26, 1985, Ser. No. 781,393
Int. Cl.[4] G05D *15/00*
U.S. Cl. 318—645 **8 Claims**



1. A variable pneumatic output servo motor and pressure regulator combination for use with ophthmalic micro-surgical instruments, the variable output being elecrtronically controlled by a control means operating said servo motor, comprising:

a servo motor means in electrical communication with said control means and having a drive shaft being rotatable clockwise or counter clockwise according to instructions from said control means;

a precision pressure regulator having an inlet port, an outlet port, an air pathway between said inlet and outlet ports, and a regulatory means for adjustably determining the level of pressure allowed to pass between said inlet and outlet ports, said regulatory means including a rotatable adjustment shaft extending from said regulator for adjusting the level of said regulatory means between a fully open level and a fully closed level;

connecting drive means operatively connected between said drive shaft of said servo motor means and said adjustment shaft of said regulator so that rotation of said drive shaft causes rotation of said adjustment shaft causing adjustment of said regulatory means between and including said fully open level and said fully closed level.

4,622,504

SPEED CORRECTING DEVICE FOR USE IN SPEED COMMAND SYSTEM

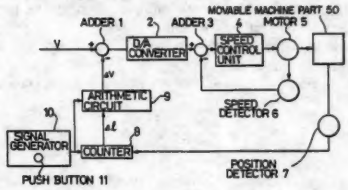
Etuo Yamazaki, Hachioji, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

Filed Apr. 27, 1983, Ser. No. 489,087
Claims priority, application Japan, Apr. 28, 1982, 57-71824
Int. Cl.[4] G05B *13/00*
U.S. Cl. 318—561 **7 Claims**

1. A speed correcting device for use in a speed command system of an apparatus in which a movable machine part is driven at a speed corresponding to a speed command value, said device comprising:

a position detector for detecting the position of the movable machine part;

velocity error detecting means for detecting, on the basis of the position detected by the position detector, the moving speed of the movable part when the speed command value is zero; and



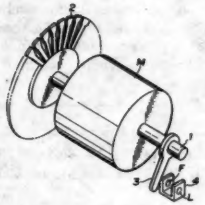
adding means for adding the detected moving speed to the speed command value to correct the speed command value so that the moving speed corresponds to the speed command value.

4,622,505

DEVICE FOR CONTROLLING ROTATION OF STEPPING MOTOR

Mitumasa Okabayashi, and Norio Shiga, both of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., LTD, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 600,003
Claims priority, application Japan, Apr. 19, 1983, 58-68640
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **3 Claims**



1. An apparatus for use in a printer to control the rotation of the drive shaft of a stepping motor having a plurality of exciting phases through which the motor is operated during a cycle of operation, said apparatus comprising:

detection means connected with the drive shaft of the stepping motor and the framework of the printer for detecting a predetermined rotational angle range of said drive shaft corresponding to a plurality of step angles the number of which is less than the number of step angles in one cycle of said motor,

means for detecting a particular step angle of said plurality of step angles, and

means for stopping the rotation of said stepping motor when the motor is excited in an exciting phase corresponding to said particular step angle.

4,622,506

LOAD AND SPEED SENSITIVE MOTOR STARTING CIRCUIT

Richard Shemanske, Brookfield, and Young-Kee Min, Milwaukee, both of Wis., assignors to PT Components, Milwaukee, Wis.

Filed Dec. 11, 1984, Ser. No. 680,489
Int. Cl.[4] H02P *1/44*
U.S. Cl. 318—786 **8 Claims**

1. In an AC motor having a main winding and an auxiliary winding both connectable to an AC power source, and having

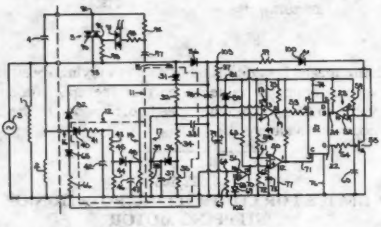
a switch for disconnecting said auxiliary winding from said AC source, an improved control circuit for said switch comprising:

main voltage detector means for sensing the magnitude of the AC main winding voltage;

auxiliary voltage detector means for sensing the magnitude of the AC auxiliary winding voltage;

initialization means sensing main winding voltage at initial energization of said motor;

flip flop means responsive to said initialization means to output a turn-on signal to said switch to connect said auxiliary winding to said AC source;



voltage comparator means responsive to said main and auxiliary detector means and comparing the magnitude of the auxiliary winding voltage against the magnitude of the main winding voltage;

said flip flop means also being responsive to said voltage comparator means to output a turn-off signal to said switch to disconnect said auxiliary winding from said AC source when the magnitude of the auxiliary winding voltage increases above a predetermined value relative to the magnitude of the main winding voltage as a function of motor speed.

4,622,507

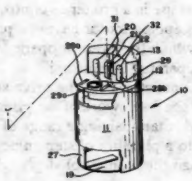
INTEGRATED BATTERY AND RECHARGER

David Persen, P.O. Box 1526, San Mateo, Calif. 94401

Filed Feb. 1, 1985, Ser. No. 697,157

Int. Cl.[4] H01M *10/46*

U.S. Cl. 320—2 **18 Claims**



1. An integrated battery and recharger comprising, a casing having parallel top and bottom ends that are at right angles to a side wall, that includes a top and base for closing over said casing ends which top consists of an upstanding shoulder formed to have a flat upper surface between upstanding side walls that extend at right angles upwardly from a flat top surface; a rechargeable electrical storage cell means and circuitry for recharging said electrical storage cell means, both for assembly within said casing; a head to fit alongside and against said upstanding shoulder, which head includes parallel flat faces that are at right angles to and between an upstanding wall having opposite sides, which sides will each fit closely against said shoulder, said head including a positive pole in one face that extends outwardly therefrom, and a pair of electrically conductive blades arranged to extend parallel to one another from the opposite head face, projecting outwardly at a normal angle to said face; electrical connector means for coupling to contacts in said head for alternatively electrically connecting said positive pole to said electrical storage cell means, when one head side is positioned against said top upstanding shoulder or for connecting said pair of blades to pass electrical current to said circuitry for recharging said electrical storage cell means when said head is repositioned relative to said top with its other side positioned against said upstanding shoulder; and means for connecting a battery negative pole across said electrical storage cell means negative side and said positive pole to said electrical storage cell means positive side.

4,622,508

LITHIUM BATTERY PROTECTION CIRCUIT

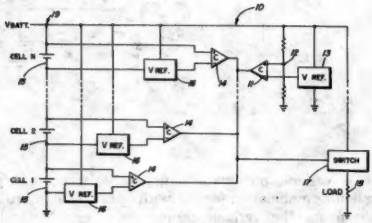
Michel Matteau, Gloucester; Howard R. Braun, Almonte, and Christopher L. Gardner, Dunrobin, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Aug. 16, 1985, Ser. No. 766,211

Claims priority, application Canada, Aug. 20, 1984, 461385

Int. Cl.[4] H02J *7/00*

U.S. Cl. 320—13 **11 Claims**



1. An apparatus for monitoring and protecting a battery having a plurality of cells, and being connected to a load, comprising:

first means for comparing the battery potential with a first reference potential;

second means for comparing the potential of each cell with a respective second reference potential and third means for comparing the potential of only one of said cells with said second reference potential;

detecting circuit means for distinguishing between first and second battery types, said first battery type having all of said cells available for monitoring by said second means, said second battery type having the total battery potential and said one cell available for monitoring by said first and third means, wherein only said one cell is available for monitoring in both said first and second battery types;

means for establishing said reference potentials; and

means for electrically disconnecting the load from the battery when either the battery potential falls below the first reference potential or a cell potential falls below the second reference potential, thus preventing further discharge of the battery and reversal of said cell.

4,622,509

METHOD OF AND CIRCUIT FOR NI-CD BATTERY CHARGE CONTROL

H. J. N. Spruijt, Wassenaar, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

Filed Nov. 9, 1983, Ser. No. 550,195

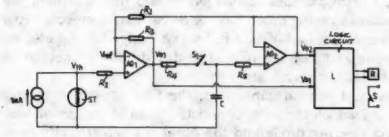
Claims priority, application France, Oct. 25, 1983, 83 16951

Int. Cl.[4] H02J *7/04*

U.S. Cl. 320—36 **7 Claims**

3. Circuit for charge control of Ni-Cd batteries used in particular on a low earth orbit spacecraft, wherein said batteries are subjected to high speed charge and discharge cycles, a

typical cycle lasting 1.5 hours, said circuit allowing said batteries to be charged by solar array means during the sunlight period of said spacecraft when a switch S of this circuit is closed and said batteries having the individual battery cells electrically isolated by means of a thermally conductive material with thin metal plates between the isolated battery cells fixed to a common metal base plate, said circuit comprising



end-of-charge detector means which detect a change of sign of the first derivative of the battery temperature, when this temperature derivative becomes positive following its negative value during charge, and which provide a signal to open said switch S which stays open for the remainder of the sunlight period, the battery temperature being sensed by suitable sensor means, placed at the location of said thin plates.

4,622,510

PARAMETRIC ELECTRIC MACHINE

Ferdinand Cap, Karl-Innerebner-Strasse 40, A-6020 Innsbruck, Austria

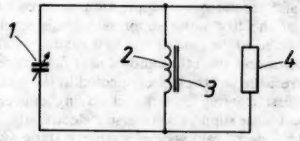
PCT No. PCT/AT82/00018, § 371 Date Jun. 24, 1983, § 102(e) Date Jun. 24, 1983, PCT Pub. No. WO83/01713, PCT Pub. Date May 11, 1983

PCT Filed Jun. 7, 1982, Ser. No. 514,816

Claims priority, application Austria, Oct. 29, 1981, 4603/81

Int. Cl.⁴ H02N *1/08*

U.S. Cl. 320—1 **7 Claims**



1. A parametric electric machine comprising a series resonant circuit which has a resistor element having a resistance, an induction coil element having an inductance and a capacitor element having a capacitance and means periodically alternating the capacitance,

(a) the resonant circuit fulfilling the condition

$$\frac{\Delta C}{C_o} \geqq 2\,R_o\sqrt{\frac{C_o}{L_o}}$$

wherein C_o is the total capacitance of the capacitor element, ΔC is the mechanically effected change of the capacitance of the capacitor element, R_o is the resistance of the induction coil element and of any additional strict resistance under no load, and L_o is the inductance of the induction coil element, and

(b) at least one of the elements is a non-linear element having an impedance dependent on the current flowing in the resonant circuit whereby the fluctuation of voltage appearing according to the transformation of mechanical work into electrical energy at the capacitor element is transformed into sinusoidal alternating voltage.

4,622,511

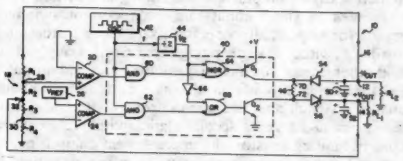
SWITCHING REGULATOR

Bruce D. Moore, Sunnyvale, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 1, 1985, Ser. No. 718,624

Int. Cl.⁴ G05F *1/44*

U.S. Cl. 323—282 **13 Claims**



1. A switching regulator for regulating voltages at a pair of output terminals, such regulator comprising: an inductor; and, means operative during a first poriton of each of a series of periods for charging the inductor in accordance with an error in voltage at a first one of the pair of terminals and then discharging such inductor to control the voltage at such first one of the pair of terminals, and, operative during a second portion of each of such series of periods to charge the inductor in accordance with an error in voltage at the second one of the pair of terminals and then discharge such inductor to control the voltage at the second one of the pair of terminals.

4,622,512

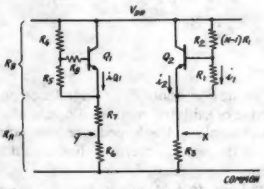
BAND-GAP REFERENCE CIRCUIT FOR USE WITH CMOS IC CHIPS

Adrian P. Brokaw, Burlington, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Feb. 11, 1985, Ser. No. 700,192

Int. Cl.⁴ G05F *3/20*

U.S. Cl. 323—313 **10 Claims**



1. A band-gap reference circuit comprising:

first and second transistors operable at different current densities to produce a ΔV_{BE} signal as a function of temperature;

first and second V_{BE} multiplier circuits each connected to the base and emitter of a corresponding one of said transistors; and

output terminal means coupled to said transistors to develop a ΔV_{BE} signal multiplied in magnitude by said multiplier circuits.

4,622,513

GATING OF THE THYRISTORS IN AN ARCLESS TAP CHANGING REGULATOR

Frederick A. Stich, Milwaukee, Wis., assignor to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Sep. 28, 1984, Ser. No. 655,923

Int. Cl.⁴ G05F *1/26*

U.S. Cl. 323—343 **4 Claims**

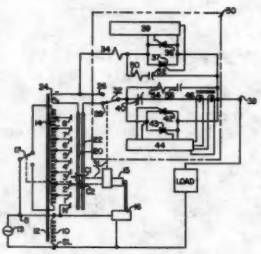
1. In a tap change voltage regulator having a tapped electricl winding with a plurality of taps, a part-tap voltage auxiliary winding inductively linked to said tapped winding, a pair of tap

selectors adapted to sequentially engage said taps, one of said tap selectors being coupled to one side of said auxiliary winding, an auxiliary switch having first and second stationary contacts coupled respectively to the other side of said auxiliary winding, an auxiliary switch having first and second stationary contacts coupled respectively to the other side of said auxiliary winding and to the second of said tap selectors; an output terminal; a main current switch coupled between said auxiliary switch and said output terminal; first static switching means connected in shunt about said main current switch; drive means for sequentially operating said tap selectors and said auxiliary switch; a tap changing shunt circuit coupled between said other side of said auxiliary winding and said output terminal thereby to provide an alternate current path about said auxiliary switch and said main current switch, said auxiliary shunt circuit having a second static switching means, and a current limiting resistor, the improvement comprising:

a controlled saturation current transformer gating circuit including:

a saturable current transformer inductively coupled to the current flowing through the main current switch, having a first secondary winding and a second secondary winding:

a first and second rectifier diodes having their anodes connected respectively to the positive lead of said first secondary winding and the negative lead of said second secondary winding, whereby said first and second rectifier diodes conduct on alternate half cycles;



a first saturation controlling impedence connected to the cathode of said first rectifier diode, and a second saturation controlling the impedence connected to the cathode of the second rectifier diode, said saturation controlling impedences having a value selected whereby the voltage drop of each impedence as current increases cause said current transformer to saturate and change the effective turns ratio of said current transformer such that the secondary currents increase at a slower rate than the primary current;

a first and second voltage and current clamping means connected respectively between said first saturation controlling impedence and said second saturating controlling impedance and the other end of said second secondary winding on their input side and having the outside sides of said first and second voltage and current clamping means connected respectively to said first static switching means; providing gating current continuously whenever current flows through the current transformer primarily such that the first static switching means is continuously able to carry the main current to the load whenever said main current switch opens, and continues to carry the main current to the load until the next alternating current zero, thereby allowing the main current switch to open arclessly; and

an overvoltage gating circuit including:

one or more zener diodes connected in series with all zener cathodes oriented in the direction of positive voltage;

a plurality of bridge diodes connected in a standard full wave bridge rectifier configuration, having said one or more zener diodes series cathode end connected to the positive terminal of said full wave bridge and the one or more zener diodes series anode end connected to the negative terminal of said full wave bridge;

a first and second steering diodes, the first steering diode having its cathode connected to a first terminal of said full wave bridge having also an anode and a cathode of said bridge diodes connected to said first terminal, the second steering diode having its cathode connected to a second terminal of said full wave bridge having also an anode and cathode of said bridge diodes connected to said second terminal;

a first and second capacitors, the first capacitor having one lead electrically connecting to the anode of said first steering diode and the other lead electrically connecting to the cathode of said first sterring diode, the second capacitor having one lead electrically to the anode of said second steering diode and the other lead electrically connecting to the cathode of said second steering diode;

a first and second silicon unilateral switches having the input of the first silicon unilateral switch electrically connected to the cathode of said first steering diode and the output of said first silicon unilateral switch electrically connected to the gate of a first auxiliary static switch thyristor, and having the input of the second silicon unilateral switch electrically connected to the gate of a second auxiliary static switch thyristor;

a first and second current limiting resistors having one end of the first current limiting resistor electrically connected to the cathode of said first auxiliary static switch thyristor and the other end of the first current limiting resistor electrically connected to the anode of said first steering diode, and having one end of the second current limiting resistor electrically connected to the cathode of said second auxiliary static switch thyristor and the other end of the second current limiting resistor electrically connected to the anode of said second steering diode; and

a first and second noise suppression resistors having one end of the first noise suppression resistor electrically connected to the gate of said first auxiliary static switch thyristor and the other end of said first noise suppression resistor electrically connected to the anode end of said first steering diode, and having one end of the second noise suppression resistor electrically connected to the gate of said second auxiliary static switch thyristor and the other end of said second noise suppression resistor electrically connected to the anode end of said second steering diode;

said overvoltage gating circuit constantly sensing for an overvoltage condition across said auxiliary static switch thyristors indicating a need to gate each of said auxiliary static switch thyristors to its respective conducting condition to carry the load current during an arcless tap change of the voltage regulator.

4,622,514

MULTIPLE MODE BUCKLING BEAM PROBE ASSEMBLY

Stephan P. Lewis, Hermosa Beach, Calif., assignor to IBM, Armonk, N.Y.

Filed Jun. 15, 1984, Ser. No. 620,983

Int. Cl.[4] G01R *1/073*

U.S. Cl. 324—158 P **3 Claims**

3. A multiple mode buckling beam probe assembly comprising:

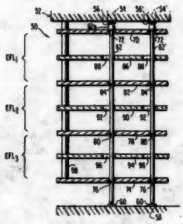
an electrical contactor positioned for movement towards and away from a substrate having laterally spaced contacts,

said electrical contactor comprising a plurality of relatively equal length wire probes,

each probe having a greater length than diameter and being bendable under axially applied loads when said contactor is moved towards said substrate to cause each of the wire probes to contact the substrate, and wherein said probes are at positions corresponding to the contacts on said substrate,

mounting means for mounting said probes for free axial movement,

said mounting means including means for slidably engaging said probes centrally thereof to divide each probe into two



lengths to allow buckling of both lengths and means to control the direction of buckling of each of the lengths under applied axial loads;

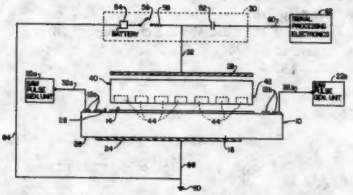
whereby, each probe acts completely independently of each other probe, and wherein the portions of said probes to opposite sides of said means for slidably engaging said probes centrally thereof deflect in sequence, dependent upon the effective free length of said probe portions to opposite sides of said means for slidably engaging said probes centrally thereof.

4,622,515

APPARATUS AND METHOD FOR CONTACTLESS CHARACTERIZATION OF PHOTODIODE MOSAICS

Jeffrey H. Everson, Reading, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 17, 1984, Ser. No. 581,386
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—158 D **14 Claims**



1. A nondestructive, contactless apparatus for testing an array of semiconductor diodes in which the diodes are arranged in rows, comprising:

a surface acoustic wave generator;

means of energizing said surface acoustic wave generator to propagate a surface acoustic wave pulse along a path;

means for mounting said array of diodes adjacent said surface acoustic wave generator with a row of said diodes spaced therefrom so that said surface acoustic wave interacts with said diodes;

means for energizing said surface acoustic wave generator to generate a first surface acoustic wave pulse to store a charge on each of said diodes along said row;

means for energizing said surface acoustic wave generator to generate a second acoustic wave pulse at a predetermined interval following said first pulse; and

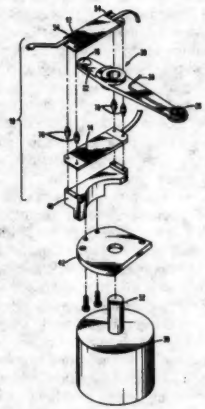
means responsive to the interaction of said second pulse with said semiconductor diodes along said row to indicate a characteristic of said semiconductor diode as a function of its ability to store said charge over said predetermined interval.

4,622,516

MAGNETIC TACHOMETER FOR DISK DRIVES

Patrick L. Hearn, Acton, Mass.; Charles M. Riggle, Colorado Springs, Colo.; Shyam C. Parikh, Stow, and Kenneth F. Veseskis, Hudson, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 16, 1983, Ser. No. 505,047
Int. Cl.[4] G01P *3/46*
U.S. Cl. 324—163 **6 Claims**



1. An arm assembly for use in a disk drive comprising:

A. arm means for supporting a magnetic transducer for writing data onto and reading data from a disk surface, said arm means being pivotal in a pivot plane about a pivot point, said arm means further supporting a permanent magnet means a selected distance from said pivot point said permanent magnet means generating a magnetic flux;

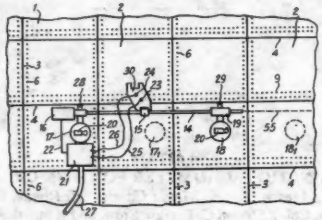
B. motor means attached to said arm means for pivoting said arm mean through a selected maximum arc; and

C. substantially longitudinal electrical coil means having two ends and an axis parallel to said pivot plane, said coil means being positioned to intercept the magnetic flux of said permanent magnet means as said arm means is pivoted through said arc so that the movement of said magnet impresses an electrical potential difference between the ends of said coil means, the angular velocity of said arm means as it is being pivoted by said motor means being related to the impressed potential difference.

4,622,517
PORTABLE DEVICE HAVING A PROBE RELEASABLY SUPPORTED ON A MOVABLE CURSOR FOR THE NON-DESTRUCTIVE EXAMINATION OF A SURFACE ALONG A LINE

Jean-Louis Arnaud, Verrieres-le-Buisson, and Michel Floret, Gennevilliers, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Jan. 26, 1984, Ser. No. 574,172
Claims priority, application France, Feb. 24, 1983, 83 03044
Int. Cl.[4] G01N *27/82*; G01R *33/00*
U.S. Cl. 324—262 **4 Claims**



2. A portable device for the non-destructive examination of a lap joint comprising an outer panel and an inner panel joined by two lines of rivets, comprising:

two probes each for producing an output signal that is used for the examination of one of said lines of rivets;

an elongated guide means having means for releasably securing said guide means to said surface parallel to said line, said guide means having a length equal to a portion of said line, said portion of said line having a negligible variation of curvature;

a cursor mounted for free sliding movement along said guide means and free rotational movement about said guide means; measuring means fixed to said guide means for indicating at each moment the positions of said cursor along said guide means;

a probe-holder having means for receiving said probe, said probe-holder being releasably mounted to said cursor such that said cursor and said probe-holder slide and rotate together relative to said guide means to allow said probe to be pressed manually towards said surface by an operator; and to allow said probe-holder to be manually displaced along said guide means with said cursor by the operator, and said probe holder having sighting means for allowing said probe-holder to be aligned with said points by the operator; and one of said probes being mounted on the probe-holder in a position adapted to examine the outer panel along one of said lines of rivets and the other of said probes being mounted on the probe-holder in a position adapted to examine the inner panel along the other line of rivets.

4,622,518
DEEP PENETRATION WELL LOGGING SYSTEM AND METHOD USING SECONDARY ELECTROMAGNETIC FIELDS

Percy T. Cox; Wayne F. Warren, and Donald L. Johnson, Jr., all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

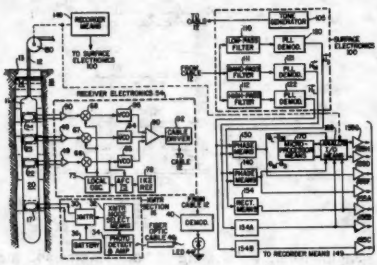
Continuation-in-part of Ser. No. 480,638, Mar. 31, 1983, abandoned. This application Apr. 6, 1984, Ser. No. 579,316
Int. Cl.[4] G01V *3/30, 3/28*
U.S. Cl. 324—341 **11 Claims**

4. A well logging method for determining the dielectric constant and/or conductivity of earth formations, some of which has fluid invasion, in the vicinity of a well borehole comprising the steps of:

transmitting electromagnetic energy into the earth formation from a first location in a borehole at a frequency within a frequency range of 10 MHz to 60 MHz,

receiving transmitted electromagnetic energy at second, third and fourth locations in a borehole, where said second location is a predetermined distance from said first location, said third location is at a greater predetermined distance from said first location than said second location and said fourth location is at a greater predetermined distance from said first location than said third location,

providing signals representative of total electromagnetic fields at the receiving locations in accordance with the received energy,



deriving a secondary field ratio from portions of the signals representative of the secondary electromagnetic fields at the second and third locations,

deriving a first phase difference between the signals representative of the total electromagnetic fields at the third and fourth locations,

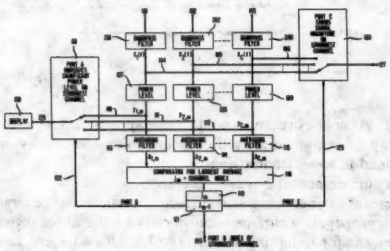
deriving a second phase difference between the signals representative of the total electromagnetic fields at the second and third locations, and

determining the dielectric constant and/or resistivity of said earth formations in accordance with the derived secondary field ratio and at least one of the derived phase differences.

4,622,519
MULTI-CHANNEL DATA SIGNAL COMBINING ARRANGEMENT

Joel Goldman, Randolph, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 25, 1983, Ser. No. 497,980
Int. Cl.[4] H04Q *3/00*; H03K *5/22, 17/00*
U.S. Cl. 328—137 **8 Claims**



1. In a data signal combining arrangement for consolidating information signals from a plurality of signal channels into a single output signal,

plural means, each responsive to signals of a different one of said channels, for averaging signal level for its one chan-

nel over a time interval comprising a fixed plurality of subintervals including a current subinterval,

means, responsive to said averaging means for said plurality of channels, for ascertaining the channel having the largest average signal level in each subinterval, and

means for outputting in a succeeding subinterval only a signal for that succeeding subinterval from one of said channels ascertained by said ascertaining means to have had the largest average signal level during said current subinterval.

4,622,520

FM DEMODULATOR WITH IMPULSE NOISE ELIMINATION CIRCUIT

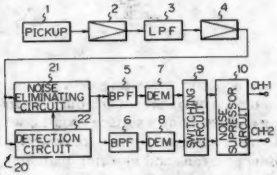
Kazuo Kuroda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,455

Claims priority, application Japan, Nov. 1, 1983, 58-169551[U]

Int. Cl.[4] H03D *3/00*; H04N *5/213*

U.S. Cl. 329—112 **4 Claims**



1. An apparatus for demodulating a frequency modulated input signal having a carrier signal component of a predetermined frequency, comprising:

a noise eliminating means for respectively detecting a positive impulse noise and a negative impulse noise which may be mixed with said frequency modulated input signal, and eliminating each of said positive and negative impulse noises from said frequency modulated input signal;

a filter means connected to said noise eliminating means, for permitting signals within a frequency band around said carrier signal component to pass therethrough; and

demodulator means connected to said filter means, for performing a frequency demodulation of an output signal of said filter means.

4,622,521

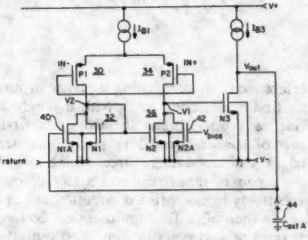
PRECISION OPERATIONAL AMPLIFIER USING DATA SAMPLING

Thomas P. Redfern, San Jose, Calif., assignor to Linear Technology Corporation, Milpitas, Calif.

Filed Dec. 23, 1985, Ser. No. 812,016

Int. Cl.[4] H03F *1/02, 3/45*

U.S. Cl. 330—9 **4 Claims**



1. In a chopper stabilized operational amplifier employing first and second CMOS transistor pairs, each transistor pair including a P channel transistor serially connected with an N channel load transistor, means for biasing said operational amplifier comprising

a first N channel transistor in parallel with the load transistor of one CMOS pair and a second N channel transistor in parallel with the load transistor of the other CMOS pair,

means for applying a bias voltage to the gate of said second transistor, and

capacitive means for applying a voltage to the gate of said first transistor to compensate for offset in the amplifier, said charge being generated when the inputs of said operational amplifier are shorted and the output forced to zero.

4,622,522

TRACK CIRCUIT FOR AC ELECTRIFIED RAILWAYS

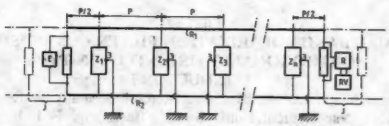
Gilbert Alt, Bois-Colombes, France, assignor to Compagne de Signaux et d'Entreprises Electriques, Paris, France

Filed Mar. 7, 1985, Ser. No. 709,393

Claims priority, application France, Jul. 27, 1984, 84 12113

Int. Cl.[4] H03H *7/075, 7/09*; B61L *1/18*

U.S. Cl. 333—24 R **6 Claims**



1. A track circuit for an AC electrified railway, said track circuit comprising two rails (R_1, R_2) of a railway track section, a transmitter (E) connected to one end of the circuit for generating therein an alternating current of an operating frequency, f, and a receiver (R) connected to the other end of said circuit for controlling the operation of a track relay (RV), said track circuit further comprising a plurality of impedances (Z_1, Z_2, . . . Z_n), each of said impedances including inductance means and capacitance means connected in parallel with said inductance means, at least said inductance means of each said impedance having a middle point tapped to ground, each of said impedances being connected between said rails (R_1, R_2) and spaced along the whole length of the rails with a given pitch (P), the values of the impedances being selected so that the transmission attenuation of the circuit at the operating frequency is always less than the transmission attenuation of a circuit of the same length having a broken rail, wherein the value L of the inductance means of each impedance and the capacitance value C of the corresponding capacitance means of each such impedance satisfies the following relation:

$$\frac{1}{2\pi\sqrt{LC}} < f.$$

4,622,523

GROUP DELAY EQUALIZERS USING SHORT CIRCUIT TRIPLE MODE FILTERS

Wai-Cheung Tang, Kitchener, Canada, assignor to Com Dev Ltd., Cambridge, Canada

Division of Ser. No. 573,462, Jan. 24, 1984. This application May 3, 1985, Ser. No. 710,156

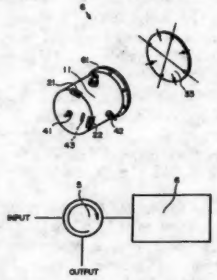
Claims priority, application Canada, May 30, 1983, 429238

Int. Cl.[4] H01P *1/208*; H04B *3/14*

U.S. Cl. 333—28 R **4 Claims**

1. An allpass filter comprising one cascade waveguide cavity resonating at its resonant frequency in three independent orthogonal modes, said cavity having two ends that are parallel to one another, at least one of said modes being non-identical to the remaining two modes, said filter being operated in a suit-

able propagation mode for input and output coupling, with an output of said cavity being short circuited so that the filter can



function as a group delay equalizer when used with a non-reciprocal structure.

4,622,524

DUAL BAND POLARIZATION FILTER COMPRISING ORTHOGONALLY ORIENTED FIN-TYPE CONDUCTORS

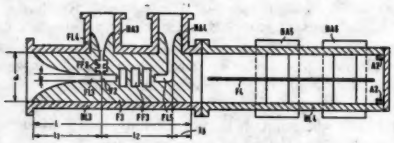
Günter Mörz, Ludwigsburg, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,097

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406641

Int. Cl.[4] H01P *1/161, 1/213*

U.S. Cl. 333—126 **10 Claims**



1. A dual band polarization filter for separating four signals by frequency and polarization, one pair of said signals being polarized in one of two orthogonal directions and another pair of said signals being polarized in the other of said two orthogonal directions, one signal of each pair having a frequency in one of two different frequency bands and the other signal of each pair having a frequency in the other of said two different frequency bands, comprising:

a first hollow waveguide section having two waveguide outputs;

a first fin-type conductor structure disposed in said first hollow waveguide section, said first fin-type conductor structure being oriented parallel to one of said two orthogonal directions and being configured to provide branching signal paths and frequency selective elements with which the signals polarized in said one of said two orthogonal directions are separated as to their frequencies and are fed to said two waveguide outputs;

a second hollow waveguide section having two further waveguide outputs; and

a second fin-type conductor structure disposed in said second hollow waveguide section, said second fin-type conductor structure being oriented parallel to the other of said two orthogonal directions and being configured to provide branching signal paths and frequency selective elements with which the signals polarized in said other of said two orthogonal directions are separated as to their frequencies and are fed to said two further waveguide outputs.

4,622,525

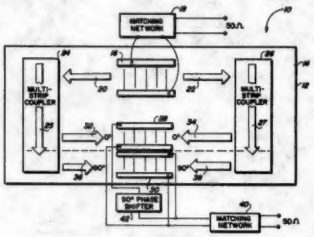
LOW LOSS SURFACE ACOUSTIC WAVE DEVICE AND METHOD

Roy B. Brown, Apopka, Fla., assignor to Sawtek, Inc., Orlando, Fla.

Filed Jul. 19, 1985, Ser. No. 756,510

Int. Cl.[4] H03H *9/145, 9/42, 9/76*

U.S. Cl. 333—151 **19 Claims**



1. A surface acoustic wave ring device on a piezoelectric medium, said device having input and output transducer means for launching and detecting a surface acoustic wave along first and second tracks from said input transducer means to said output transducer means and in a ring path along said piezoelectric medium, and means for cancelling any multiple transits of said surface acoustic wave, said cancelling means comprising means introducing a phase shift between portions of said surface acoustic wave along each of said first and second tracks between said input and output transducer means, said output transducer means adapted to receive said phase-shifted portions of said acoustic wave along both of said tracks.

4,622,526

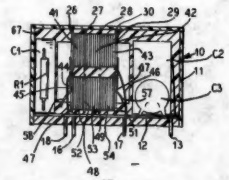
POWER LINE INTERFERENCE FILTER MOUNTED ON A PC BOARD

Lon M. Schneider, Arlington Heights, and William R. Walters, McHenry, both of Ill., assignors to Corcom, Inc., Libertyville, Ill.

Filed Sep. 14, 1984, Ser. No. 650,651

Int. Cl.[4] H03H *7/09*

U.S. Cl. 333—181 **5 Claims**



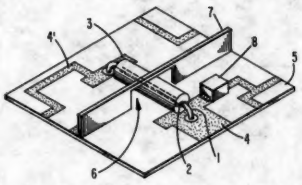
1. An interference filter comprising a planar printed circuit board having first and second ends with a conductive area which provides a ground plane formed on a first surface thereof, a pair of spaced grounding pins connected to the circuit board in said conductive area which provides said ground plane, a pair of input pins and a pair of output pins mounted respectively in said printed circuit board at said first and second ends thereof, a first multisection coil connected between first ones of said pairs of input and output pins and mounted on a second surface opposite to said first surface and extends above said second surface of said printed circuit board, a second multisection coil connected between second ones of

said pairs of input and output pins and mounted on said second surface and extends above said second surface of said printed circuit board, and a magnetic core coupling said first and second multisection coils and mounted on said second surface and extends above said second surface of said printed circuit board, a first capacitor connected between said pair of input pins and mounted on said second surface and extends above said second surface of said printed circuit board, and a second capacitor connected between said pair of output pins and mounted on said second surface and extends above said second surface of said printed circuit board, a resistor connected between said pair of input pins, a third capacitor mounted on said second surface and extends above said second surface of said printed circuit board and between a first one (13) of said pair of output pins and a first one (16) of said pair of spaced grounding pins, and a fourth capacitor mounted on said second surface and extends above said second surface of said printed circuit board and connected between a second one (14) of said pair of output pins and said first one (16) of said pair of spaced grounding pins, wherein said first multisection coil comprises a first multisection bobbin mounted on said second surface and extends above said second surface of said printed circuit board and formed with a central section at a center portion thereof which is formed with a rectangular opening and a plurality of partitions attached about and to said central section with coil sections of said first coil wound between adjoining partitions wherein said second multisection coil comprises a second multisection bobbin mounted on said second surface and extends above said second surface of said printed circuit board and formed with a central section at a center portion thereof which is formed with a rectangular opening and a plurality of partitions attached about and to said central section with coil sections of said second coil would between adjoining sections and said magnetic core being rectangular in cross-section and extending through the central sections of said first and second bobbins to magnetically couple said first and second coils together.

4,622,527
ISOLATION OF RF SIGNALS IN A RF SHIELD APERTURE

David J. Carlson, Marion County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 20, 1985, Ser. No. 746,145
Int. Cl.[4] H03H 7/01
U.S. Cl. 333—182 **4 Claims**



1. RF signal suppression apparatus comprising:

a printed circuit board;

an RF shield, mounted on said printed circuit board, and having an aperture therethrough;

said aperture being coterminous with the surface of said printed circuit board;

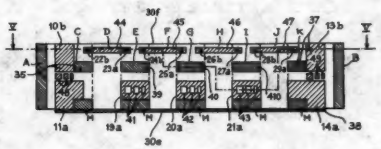
an oblong ferrite bead and conductor assembly including an oblong ferrite bead having a hole therethrough along its major axis; a conductor extending through said hole in said oblong ferrite bead and projecting out both ends of said bead to allow connection to external conductors of circuits on opposite sides of said RF shield; said oblong ferrite bead and conductor assembly being positioned in said RF shield aperture with said ferrite bead extending beyond both sides of said RF shield; and

a capacitor coupled between one end of said conductor of said oblong ferrite bead and conductor assembly and a point of reference potential, said capacitor in combination with said oblong ferrite bead and conductor assembly forming a filter circuit for passing low frequency signals between said circuits on opposite sides of said RF shield but inhibiting the coupling of RF signals between said circuits; said oblong ferrite bead and conductor assembly being affixed to said printed circuit board only.

4,622,528
MINIATURE MICROWAVE FILTER COMPRISING RESONATORS CONSTITUTED BY CAPACITOR-COUPLED REJECTOR CIRCUITS HAVING TUNABLE WINDOWS

Roland Milard, Levis St. Nom, France, assignor to Alcatel Thomson Espace, Courbevoie, France

Filed Sep. 11, 1984, Ser. No. 649,592
Claims priority, application France, Sep. 27, 1983, 83 15335
Int. Cl.[4] H01P 1/203
U.S. Cl. 333—205 **10 Claims**



1. A miniature microwave filter comprising capacitor-coupled rejector circuits having a plurality of inductance coils associated with a plurality of capacitors which include tuning capacitors and coupling capacitors, wherein each one of the tuning and coupling capacitors of the rejector circuits is composed of corresponding parallel metal plates supported by a substrate of dielectric material and separated by the dielectric material of the substrate, the surface of at least one plate of each one of the plurality of said capacitors being provided with windows, any one of said windows can be sealed off by means of a metal deposit; and wherein any one of said windows, upon being sealed-off by the metal deposit alters the value of capacitance of a corresponding capacitor to tune the filter.

4,622,529
OPERATING MECHANISM FOR A LOW VOLTAGE MULTIPOLE CIRCUIT BREAKER

Pierre M. Batteux, Vizille, and Robert M. Denis, Grenoble, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Oct. 3, 1984, Ser. No. 657,197
Claims priority, application France, Oct. 21, 1983, 83 17017
Int. Cl.[4] H01H 73/02
U.S. Cl. 335—21 **8 Claims**

1. An operating mechanism for an electric multipole circuit-breaker having a molded insulating housing including a lower bottom wall, and an upper cover wall, said mechanism comprising in combination:

a pivotal manual operating handle comprising an extended base, located inside said housing between the mechanism and the upper cover wall;

two stationary parallel support plates extending in a longitudinal direction, and having upper edges forming a fixed guiding part cooperating with said extended base of said handle upon moving of the handle along a pivoting movement in said longitudinal direction;

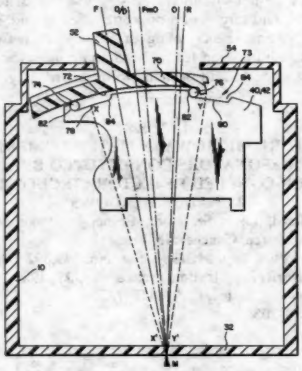
a toggle device including a lower rod and an upper rod, both pivoting on a pivot pin, so as to constitute a knee of said toggle;

a transverse switch bar which is common to all the poles and

mechanically coupled with the lower rod of said toggle device;

a pivotal trip lever articulated to the upper rod of said toggle device;

a stored energy spring fitted between the handle and the pivot pin of said toggle; and



said edges of said fixed guiding part having an inclined surface which determines the trajectory of the pivoting movement of said handle, said handle having a fictitious pivoting axis located near the lower bottom wall of said housing.

4,622,530

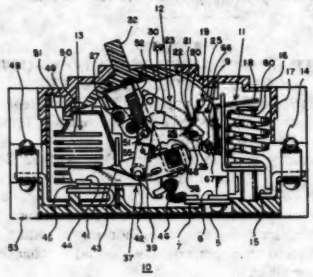
CIRCUIT BREAKER ASSEMBLY FOR HIGH SPEED MANUFACTURE

Ronald D. Ciarcia, Southington; Gregory T. Di Vincenzo, Plainville; Dennis J. Doughty, Plainville, and Richard E. Bernier, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 500,643, Jun. 2, 1983, abandoned. This application Apr. 1, 1985, Ser. No. 718,409

Int. Cl.[4] H01H *9/20*

U.S. Cl. 335—167 **2 Claims**



1. A circuit breaker assembly comprising:

a pair of separable contacts;

operating means including a pair of operating springs under the control of an on-off handle and a trip bar;

latch means operatively abutting said operating means for opening said contacts upon pre-determined current through said contacts; and

arc chute means for controlling arcs which occur upon opening said contacts;

said latch means including;

a primary latch supported on a side frame by a primary latch pivot and capturing an end of a cradle pivotally connected within said operating means defining a first point of reference;

a secondary latch supported on said side frame by a secondary latch pivot and operatively abutting said primary latch whereby a surface on said secondary latch at a first end is in interfering relation with a surface on said primary latch defining a second point of reference holding said primary latch from rotation when said cradle is captured by said primary latch said secondary latch releasing said primary latch upon motivation by said trip bar at a third point of reference on said secondary latch opposite said first end;

said primary latch pivot being offset from said first point of reference by a first distance (X_1) in a first plane and from said second point of reference by a second distance (X_2) in a second plane perpendicular to said first plane;

said secondary latch pivot being offset from said second point of reference by a third distance (X_3) in said first plane and being offset from said third point of reference by a fourth distance (X_4) in said second plane; whereby a trip force exerted on said secondary latch to separate said primary and secondary latches is given by:

$$P_2 = P_1 \frac{\omega}{\frac{X_2}{X_1} \cdot \frac{X_4}{X_3}}$$

when

P1 is a latch force provided by said contact springs,

ω is a coefficient of friction,

X_2/X_1 is the ratio of said second separation distance to said first separation distance,

X_4/X_3 is the ratio of said fourth separation distance to said third separation distance said fourth separation distance being greater than said third separation distance.

4,622,531

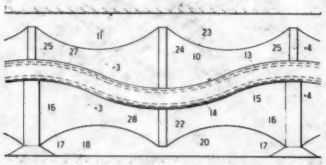
SUPERCONDUCTING ENERGY STORAGE MAGNET

Yehia M. Eyssa; Roger W. Boom, both of Madison; Warren C. Young, Middleton, all of Wis.; Glen E. McIntosh, Boulder, Colo., and Mostafa K. Abdelsalam, Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 26, 1985, Ser. No. 727,489

Int. Cl.[4] H01F *7/22*

U.S. Cl. 335—216 **23 Claims**



1. A superconducting magnet comprising:

(a) a first, outer coil of one layer of conductor including at least a superconducting composite material;

(b) a second, inner coil of one layer of conductor including at least a superconducting composite material, the second coil disposed adjacent to the first coil with each turn of the second inner coil at substantially the same level as a turn on the first coil;

(c) an inner support structure between the first and second coils and engaged to the conductors thereof, including

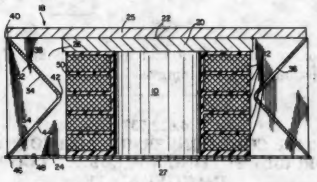
support rails associated with each turn of conductor in each coil and in contact therewith along its length at positions on the inwardly facing periphery of the conductor, the rail associated with each conductor being electrically isolated from other rails in the inner support structure, whereby the magnetic field produced by a current flowing in the same direction through the conductors of the first and second coils will produce a force on the conductors that will be directed inwardly toward the inner support structure.

4,622,532

HOURGLASS MAGNET

Timothy J. Kluessendorf, Racine, Wis., assignor to Magnetics International, Inc., Cudahy, Wis.

Filed Apr. 17, 1985, Ser. No. 724,323
Int. Cl.[4] H01F *7/20*
U.S. Cl. 335—292 **8 Claims**



1. An improved enclosure for confining a cooling fluid about an electromagnet of the type having a core with a core axis, at least one coil disposed about the core and a current source coupled to the coil to establish a magnetic field, the improvement comprising:

at least a portion of a peripheral wall of the enclosure surrounding the core axis having a configuration that presents a substantially increased surface area to the cooling fluid and to the atmosphere than a comparable straight wall between a top and a bottom wall of the electromagnet, and said cooling fluid bathes the coil and the inside surface of the peripheral wall,

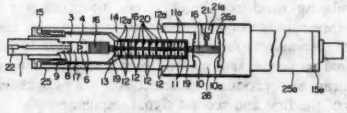
whereby at least a part of the peripheral wall portion is in closer proximity to the coil than the remainder of the wall portion to enhance absorption and dissipation of heat therefrom.

4,622,533

SELF-RECOVERY TYPE CURRENT LIMITING ELEMENT

Sadao Mori; Tsuruo Yorozuya, both of Chofu; Yuichi Wada, Kawanishi, and Yasuhide Shinozaki, Takarazuka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 22, 1985, Ser. No. 725,498
Claims priority, application Japan, Apr. 24, 1984, 59-82517
Int. Cl.[4] H01H *37/36, 61/00*
U.S. Cl. 337—114 **8 Claims**



1. A self-recovery type current limiting device for suppressing overcurrent conditions and capable of recovering so as to be operated under normal conditions, said device comprising:

current limiting material;

a pair of cylinders;

a plurality of annular insulating members coaxially arranged along the axis of each cylinder and having interconnected through holes filled with said current limiting material to form an axial current limiting path extending longitudinally through the respective cylinder;

an entrance opening in one end of each cylinder and a buffer in the axial current limiting path at the other end of each cylinder;

a coupler connected to the one end of each cylinder, said coupler having a filling passage extending to the entrance opening of each cylinder and an exterior filling port connected to said filling passage for filling the interconnected through holes in said insulating members in each cylinder and said filling passage with said current limiting material; and

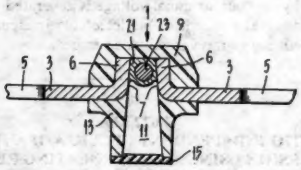
means constricting a region of the path in each cylinder near the coupler including certain of said annular members in each cylinder disposed in the region nearer the entrance opening having through holes of a smaller cross-sectional area than the other annular members in the respective cylinder for causing vaporization of said current limiting material in response to current overload to start near the coupler in the constricted region and to proceed axially away from the coupler along the path through each cylinder to dissipate heat radially progressively the full length of each cylinder.

4,622,534

THERMAL FUSE

Noel T. Bowman, 5 Arundel Court, Mount Eliza, Victoria 3930, Australia

Filed Feb. 14, 1985, Ser. No. 701,639
Claims priority, application Australia, Feb. 15, 1984, PG3628
Int. Cl.[4] H01H *37/76*
U.S. Cl. 337—404 **7 Claims**



1. A thermal fuse for use in interconnection of lead acid batteries and adapted to fuse as a result of heat being conducted through said fuse from the batteries or other devices to which it is attached, rather than as a result of direct heating of the fuse consequent on the current carried by said fuse, said fuse comprising:

a pair of mounting plates for permitting current to serially flow therethrough to devices to which they are attached, and

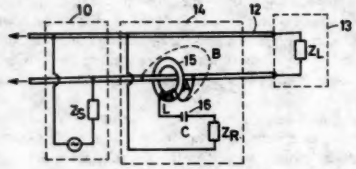
a heat meltable electric current conducting material disposed in its solid form between the mounting plates and providing a flow path for electric current between the mounting plates, said heat meltable electric current conducting material connecting with a member which will remain unmelted at the temperature at which the heat meltable electric current conducting material melts, said member being of sufficient dimensions so that when the heat meltable electric current conducting material melts it will fall by gravity from between the mounting plates and draw substantially all of the heat melted material with it.

4,622,535

RECEIVING CIRCUIT FOR A DATA TRANSMISSION SYSTEM

Hasahiro Ise, Kashihara; Hidehiko Tanaka, Tenri; Katsuyuki Machino, Nara; Toshiyuki Matsubara, and Teiji Terasaka, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 8, 1983, Ser. No. 483,252
Claims priority, application Japan, Apr. 14, 1982, 57-62785
Int. Cl.[4] H04M *11/00*
U.S. Cl. 340—310 R 4 Claims



1. In a system for transmitting data signals from a transmitting station over a transmission line to a receiving station, the transmission line having a variable load impedance caused by one or more load devices connected thereto, a data detection circuit in said receiving station comprising:

(a) current detector means magnetically coupled to said transmission line for detecting current signal components of said data signals therein;

(b) voltage detector means directly coupled to said transmission line for generating voltage signal components of said data signals; and

(c) output impedance means for simultaneously receiving said current signal components of said data signal and said voltage signal components of said data signal, and for developing an output signal voltage across the impedance means from said current and voltage signal components of said data signals;

whereby said output signal voltage is generated with a sufficient signal strength to be detectable irrespective of the impedance of the variable load impedance.

4,622,536

RATIO INDEPENDENT CYCLIC A/D AND D/A CONVERSION USING A RECIPROCATING REFERENCE APPROACH

Cheng-Chung Shih, Albany, and Paul R. Gray, Orinda, both of Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Sep. 28, 1984, Ser. No. 655,642
Int. Cl.[4] H03M *1/06, 1/40*
U.S. Cl. 340—347 DA 15 Claims

1. An apparatus for analog-to-digital signal conversion and for digital-to-analog signal conversion comprising:

first means for sampling, holding, and amplifying a signal;

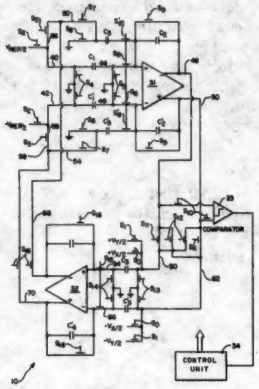
second means for sampling, holding, and amplifying a signal;

third means for communicating the output of the first means to the input of the second means and the output of the second means to the input of the first means;

fourth means for introducing an input signal to be converted to one of said first means and said second means;

fifth means for introducing a reference signal to be combined with the input signal to one of said first means and said second means;

control means circulating said input signal, to be converted, from one of the first means and the second means, to the other of said first means and the second means, and for circulating said reference signal, to be combined with the input signal, from one of the first means and the second



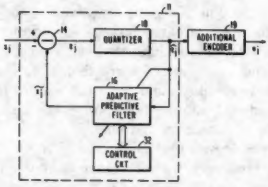
means, to the other of said first means and the second means, and for combining said signals.

4,622,537

PREDICTIVE CODE CONVERSION METHOD CAPABLE OF FORCIBLY PUTTING A FEEDBACK LOOP IN AN INACTIVE STATE

Shinichi Aiko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,032
Claims priority, application Japan, Jul. 29, 1983, 58-13902
Int. Cl.[4] H03M *1/12*
U.S. Cl. 340—347 DD 5 Claims



1. A method for use in an adaptive differential pulse code modulation system to convert a selected one of first and second signal sequences into the other signal sequence by the use of an adaptive predictor which is responsive to said second signal sequence to produce a third signal sequence, predictive of said first signal sequence, said adaptive predictor comprising tap signal producing means having a plurality of taps assigned with prediction coefficients, respectively, for producing a plurality of tap signals in response to said second signal sequence, respectively, coefficient signal producing means for adaptively producing a plurality of coefficient signals representative of said prediction coefficients, respectively, a plurality of multipliers responsive to said tap signals and said coefficient signals for calculating products therebetween to product product signals representative of said products, respectively, and output means responsive to said product signals for producing said third signal sequence, said method comprising the step of:

monitoring said products to detect absence of said selected one of the first and second signal sequences;

comparing each os said products with a predetermined value to detect whether or not said each product is greater than said predetermined value and thereby to indicate absence

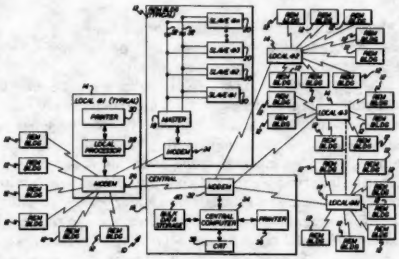
of said selected one of the first and second signal sequences; and

rendering said each product zero when said product is not greater than said predetermined value.

4,622,538
REMOTE MONITORING SYSTEM STATE MACHINE AND METHOD

Charles Whynacht, Glastonbury, Conn., and Robert E. Hall, Singer Island, Fla., assignors to Otis Elevator Company, Farmington, Conn.

Filed Jul. 18, 1984, Ser. No. 632,071
Int. Cl.[4] G08B *29/00*; B66B *3/00*
U.S. Cl. 340—506 **15 Claims**



1. Apparatus for evaluating the performance of at least one operating system which normally operates sequentially from state-to-state in a closed loop sequential chain of linked normal operating states, said apparatus monitoring the states of a plurality of two-state parameter signals provided by each monitored system, each parameter signal representative of a different one of a like plurality of operating system parameters, said apparatus providing periodic performance message signals indicative of the various possible operating conditions of each monitored system including inoperative conditions indicative of system degradation, said apparatus also providing immediate alarm message signals indicative of system failures requiring immediate corrective action, comprising:

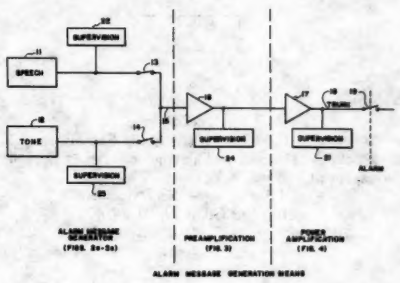
signal processor means, responsive to said two-state parameter signals from each monitored system, and having means for storing signals including said two-state parameter signals, and having means for comparing the states of parameter signals selected according to the present operating condition of each monitored system with stored signals indicative of transitions from said present operating condition to a subsequent operating condition, said comparing means detecting transitions from said present operating condition to an inoperative condition, to an operative condition and to an alarm condition, and for providing transition signals indicative thereof, said signal processor having means for counting transition signals indicative of transitions between particular normal operating conditions of each monitored system, for counting transition signals indicative of transitions between particular normal operating conditions and particular inoperative conditions, said signal processor having means for periodically providing performance message signals indicative of the count of detected transitions for each monitored system, said signal processor also having means for providing immediate alarm message signals for each monitored system indicative of detected transitions from inoperative conditions to alarm conditions; and

display means, responsive to said alarm message signals for displaying alarm messages corresponding to each alarm condition detected in each monitored system, and responsive to said performance message signals for displaying performance messages corresponding to the count of said detected transitions in each monitored system.

4,622,539
ALARM SYSTEM WITH ALARM MESSAGE SUPERVISION

Leonard A. Buss, Mt. Prospect; Phillip J. Loeb, Palatine, and Daniel G. Prysby, Elk Grove, all of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 3, 1984, Ser. No. 606,439
Int. Cl.[4] G08B *29/00*
U.S. Cl. 340—506 **48 Claims**



1. An alarm message generation and broadcast system having supervision comprising:

alarm message generation means for generating an alarm message;

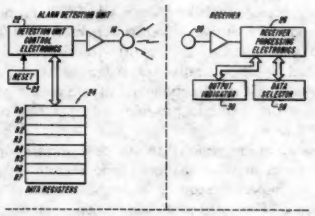
an output for receiving said alarm message so that said alarm message can be broadcast in response to an alarm event; and,

supervision means connected to said alarm message generation means and responsive to said alarm message for providing a trouble signal when said alarm message is not properly received by said supervision means.

4,622,540
SECURITY SYSTEM STATUS REPORTING

John K. Guscott, Lynnfield, and Mario D. Casamassima, Randolph, both of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed Mar. 5, 1984, Ser. No. 586,101
Int. Cl.[4] G08B *1/00*; H04Q *7/00*
U.S. Cl. 340—531 **12 Claims**



1. For use in an alarm system apparatus for optically transmitting data representative of selected alarm detection unit parameters for reception by a remote receiver comprising:

at least one register adapted to receive data representative of selected alarm detection unit status information;

means for loading each of said registers at selected times with said data;

a light emitting element disposed in a viewable location on the alarm detection unit and operative to emit light in response to electrical energization of the element;

control circuitry operative to consecutively read the data in each of said registers and to convert the data from each of

said registers into an activating signal comprising a serial bit stream protocol;

means for electrically energizing said light emitting element in response to said activating signal to optically transmit data representative of said selected alarm detection unit status information for reception by the remote receiver.

4,622,541

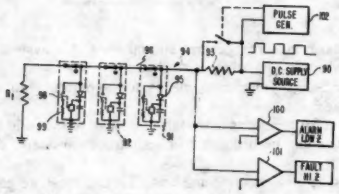
INTRUSION DETECTION SYSTEM

Roy Stockdale, Halesite, N.Y., assignor to Napco Security Systems, Inc., Copiague, N.Y.

Filed Jan. 9, 1984, Ser. No. 569,527

Int. Cl.[4] G08B *13/00, 29/00*

U.S. Cl. 340—566 **21 Claims**



1. An intrusion detection system, comprising:

first and second lines with one of said lines being a common,

a plurality of sensors arranged in parallel between said lines, with each sensor including unidirectional rectifying means for providing a DC operating potential to each sensor upon application to said first line of a potential of a given polarity, with each sensor further including latching means responsive to sensor operation to provide a given impedance across said lines when said sensor is operated due to an intrusion,

a terminating impedance arranged in parallel with said sensors between said lines,

driving means coupled between said lines and operative to provide a repetitive waveform characterized in having a first cycle indicative of a first transititon period and a second cycle indicative of a second transition period, whereby said unidirectional rectifying means is responsive to said first cycle to provide said operating potential to said sensors,

processing means coupled to said first line and operative to provide a first impedance during said first cycle and a second impedance during said second cycle of said repetitive waveform said processing means including detection means operative during said second cycle to detect the voltage on said loop as determined by said second impedance, said line terminating impedance and said given impedance whereby if a sensor is operated due to an intrusion, said processing means detects a low voltage condition during said second cycle, whereby if said line terminating impedance were removed said processing means detects a high voltage condition during said second cycle in accordance with the expected ratio of said line terminating impedance and said given impedance as compared to said second impedance, with said first impedance of said processing means being of a value to prevent the operation of said detection means during said first cycle.

4,622,542

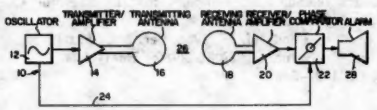
MAGNETIC ARTICLE SURVEILLANCE SYSTEM, METHOD AND CODED MARKER

Jon N. Weaver, Lake Park, Fla., assignor to Controlled Information Corporation, Lake Park, Fla.

Filed Jun. 26, 1985, Ser. No. 748,997

Int. Cl.[4] G08B *13/18*

U.S. Cl. 340—572 **17 Claims**



1. An article surveillance system, comprising:

means for generating and transmitting phase locked reference signals in a detection zone;

a plurality of coded markers, each marker having means for generating harmonic signals of a predetermined phase shift responsive to the phase locked reference signals;

means for receiving the phase shifted harmonic signals generated by coded markers in the detection zone;

means for determining the relative phase shift between the reference signals and the harmonic marker signals; and,

means for generating a control signal responsive to identification of a valid code by the determining means.

4,622,543

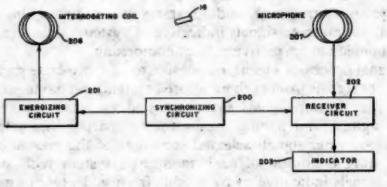
SURVEILLANCE SYSTEM HAVING ACOUSTIC MAGNETOMECHANICAL MARKER

Philip M. Anderson, III, 50 Rose Terrace, Chatham, N.J. 07928, and Jeffrey C. Urbanski, 62 Woodlawn Rd., Sparta, N.J. 07871

Filed Mar. 22, 1984, Ser. No. 592,137

Int. Cl.[4] G08B *13/26*

U.S. Cl. 340—572 **37 Claims**



1. For use in a magnetic article surveillance system, a marker which, when armed, is adapted to resonate at a frequency provided by an incident magnetic field applied within an interrogation zone and to have a substantial change in acoustic output level at said frequency that provides said marker with signal identity, said marker being a strip of magnetostrictive ferromagnetic material disposed adjacent to a hard magnetic element which, upon being magnetized, magnetically biases said strip and arms it to resonate at said frequency, said strip having magnetomechanical coupling factor, k greater than 0, where $k=\sqrt{(1-f_r^2/f_a^2)}$, f_r and f_a being the resonate and antiresonant frequencies, respectively.

4,622,544

LOW BATTERY INDICATOR

Theodore Bially, Sudbury, and Marc W. Ditz, Brookline, both of Mass., assignors to Lifeline Systems, Inc., Watertown, Mass.

Filed May 13, 1985, Ser. No. 733,713

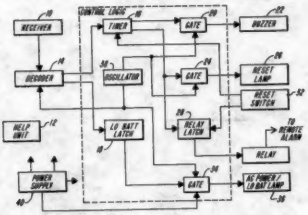
Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—636 **9 Claims**

9. For use in an emergency response system in which a

wireless help unit transmits a signal to a receiver for initiating an emergency signal after a predetermined time interval, means in the receiver for denoting a low battery condition for a battery in the help unit, said means comprising:

means for deriving from the signal transmitted by the help unit data signifying the condition of the battery;



means operative upon detection of low battery data to provide an output indication of low battery condition;

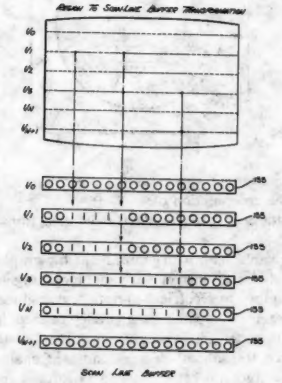
means for resetting said operative means only after receipt of a signal from the help unit containing data signifying a fresh battery.

4,622,545

METHOD AND APPARATUS FOR IMAGE COMPRESSION AND MANIPULATION

William D. Atkinson, Los Gatos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 30, 1982, Ser. No. 428,635
Int. Cl.[4] G09G 1/00
U.S. Cl. 340—747 **35 Claims**



1. A computer display system, comprising:

display means for providing a display including a plurality of display elements, each of said display elements being selectively enabled;

memory means for storing a plurality of inversion points, each of said inversion points having a coordinate corresponding to an element on said display, wherein the coordinates of each inversion point specify orthogonal lines extending in the direction of subsequently enabled display elements from said inversion point and forming two boundaries of a contrasting area;

processing means coupled to said memory means for enabling elements on said display which correspond to said stored inversion points, and generating said contrasting areas on said display, the contrast of an area being a function of the coordinates of previously displayed inversion points;

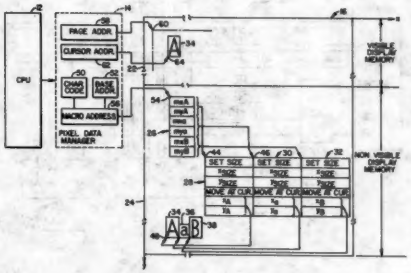
whereby a region which comprises a plurality of inversion points may be displayed by enabling said corresponding elements and generating said associated contrasting areas on said display means.

4,622,546

APPARATUS AND METHOD FOR DISPLAYING CHARACTERS IN A BIT MAPPED GRAPHICS SYSTEM

Adrian Sfarti, Sunnyvale, and Steven Dines, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 23, 1983, Ser. No. 564,970
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—748 **26 Claims**



1. In an apparatus having a character information memory and a visible display memory, wherein said character information memory includes descriptive information for a character set, said descriptive information includes an address table, pairs of macro-instructions and character bit maps, each of said pairs of macro-instructions corresponds to one character of said character set, at least one of said macro-instructions in each of said pairs includes a character address that points to the memory location of its corresponding character bit map, and said address table includes macro-instruction addresses that point to the memory locations of said macro-instructions, said apparatus comprising:

processing means coupled to said character information memory and to said visible display memory for fetching a designated portion of the contents of said display memory and a character code that designates a character in said character information memory which is to be combined with said designated portion of the contents of said display memory, said processing means including means for fetching said pair of macro-instructions which correspond to said character code from said character information memory, and means including an arithmetic logic unit means for executing said pair of macro-instructions to selectively combine logically or arithmetically said character from said character information memory with said designated portion of said contents of said visible display memory and copy the result therefrom back into said visible display memory.

4,622,547

MEMORY ACCESS CONTROL APPARATUS

Shunsuke Furukawa, Tokyo; Yoshitsugu Hattori, Ichikawa; Yoshihiko Matsumoto, Isezaki, and Hiroshi Okubo, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,083
Claims priority, application Japan, Jul. 7, 1981, 56-106127
Int. Cl.[4] G06F 9/00
U.S. Cl. 340—750 **6 Claims**

1. A display memory access control system in combination

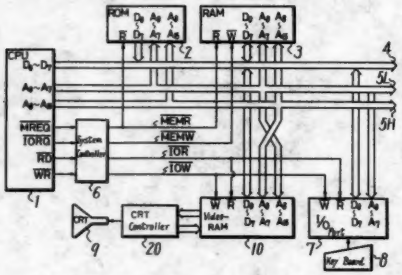
with an asynchronous central processing unit providing main memory addresses and I/O addresses and including a master clock emitting clock pulses at a predetermined frequency, with each of said I/O addresses being provided for a duration greater than three cycles of said clock pulses, comprising:

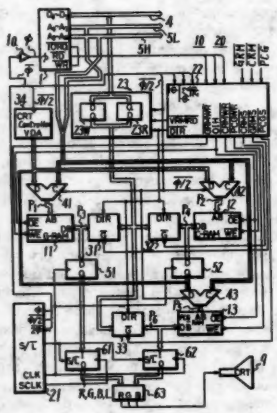
main memory means addressable by said main memory addresses from said central processing unit;

display random access memory means for storing display data and being addressable by said I/O addresses from said central processing unit so that the work area available for programs in said main memory means is not restricted by the need to store display data;

display means for displaying the display data stored in said display random access memory means;

display controller means for generating addresses for DMA addressing of said display random access memory means;





data bus means connecting said display random access memory means with said central processing unit and with said display means;

address bus means connecting said central processing unit and said display controller with said display random access memory means;

multiplexing means interposed in said address bus means and having a first state in which said I/O addresses from said central processing unit are applied to said display random access memory means, and a second state in which said addresses generated by said display controller means are applied to said display random access memory means so that there is no decrease in the processing speed of said central processing unit when providing direct access to said display random access memory means by said display controller means;

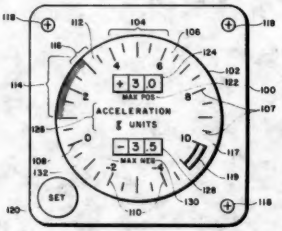
and multiplexing control means generating a control signal applied to said multiplexing means and having alternating first and second levels corresponding to said first and second states, respectively, of said multiplexing means and which are cyclically repeated at a frequency which is one-half said predetermined frequency of the clock pulses thereby avoiding the need for high speed operation of said display random access memory means.

4,622,548

SOLID STATE ELECTRONIC G-FORCE INDICATOR

James R. Andres, Vandalia, Ohio, and Donald D. Wilson, Norman, Okla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 23, 1985, Ser. No. 693,926
Int. Cl.[4] G01P *1/07*
U.S. Cl. 340—753 **27 Claims**



1. Flight instrument apparatus for use by an aircraft pilot comprising the combination of:

an acceleration G force to electrical signal transducer element;

a pilot viewable length organized analog graphic display capable of aircraft instrument panel mounting and including a plurality of electrical-to-optical transducer element graph segments located in a predetermined lengthwise expansible geometric arrangement in the face thereof;

said G force transducer element and said analog graphic display being each responsive to G-force signals in the positive and negative force directions;

electrical circuit means for exciting said display transducer element segments in lengthwise cumulative magnitude responsive incremental order in response to said acceleration G force electrical signal;

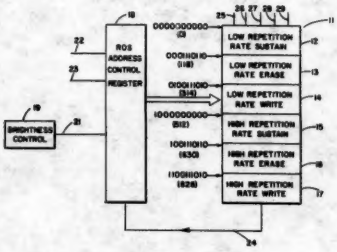
said G force to electrical signal transducer element, said display and said electrical circuit means being mounted within a single instrument housing and including adjustable gain control means capable of compensating off-axis mounting of said instrument in an aircraft instrument panel;

said gain control means including a plurality of gain determining resistance elements and means connected with said resistance elements for selecting different of said resistance elements in response to said instrument being mounted in different aircraft.

4,622,549
REPETITION RATE COMPENSATION AND MIXING IN A PLASMA PANEL

Tony N. Criscimagna, Woodstock; Harry S. Hoffman, Jr., Saugerties, and Thomas J. Milich, New Windsor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1983, Ser. No. 509,001
Int. Cl.[4] G09G 3/26
U.S. Cl. 340—805 17 Claims

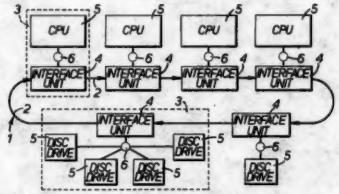


1. A plasma panel display system comprising:
a plurality of addressable control signals to gate energizing signals to illuminable cells in a panel display,
means responsive to each of said control signals for gating said energizing signals at a different one of a plurality of repetition rates;
a storage device for storing said control signals; and
addressing means for addressing selected ones of said stored control signals in combination which produce groups of said energizing signals having a uniform repetition rate for each group.

4,622,550
DATA COMMUNICATION SYSTEM

Stuart O'Connor, Glossop; Donald Bell, Stockport, and Stuart L. Dean, Oldham, all of England, assignors to International Computers Limited, London, England

Filed Apr. 18, 1983, Ser. No. 485,873
Claims priority, application United Kingdom, Apr. 28, 1982, 8212265
Int. Cl.[4] H04Q 5/00
U.S. Cl. 340—825.05 22 Claims

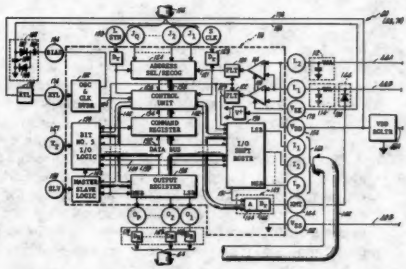


1. A method of data communication which comprises transmitting a message from a first station, which message includes an acknowledgement field holding a count set at an initial value, passing the message successively through each of a plurality of other stations, some at least of which are destination stations, some of said destination stations perform an acknowledgement to indicate acceptance of the message, said acknowledgement comprising changing the said count in the acknowledgement field of the message by an amount and in a direction that is constant and the same for every one of said destination stations, returning a final value of said count to the first station, and checking whether said final value equals a predetermined reference value corresponding to acknowledgement by every one of said destination stations.

4,622,551
HALF-DUPLEX INDUSTRIAL COMMUNICATIONS SYSTEM

Bertram F. Kupersmith; Julian H. Shull; Gary G. Full, and Gregory A. Schienda, all of Tucson, Ariz., assignors to Otis Elevator Company, Farmington, Conn.

Filed Oct. 27, 1983, Ser. No. 546,219
Int. Cl.[4] H04Q 9/00; H04L 25/00
U.S. Cl. 340—825.06 9 Claims

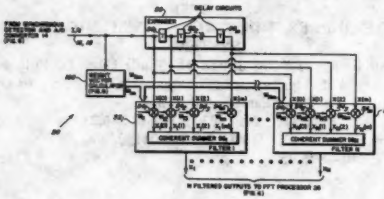


1. A serial data communications system for providing synchronous half duplex data signal communication between a central control device having a source of timing signals and a source of electrical power signals, and one or more remote controlled devices, comprising:
plurality of industrial communications units (ICU) means, including master ICU means responsive to the central control device and slave ICU means responsive to each remote controlled device, said master and said slave ICU means each having a device input/output (I/O) interface adapted for signal connection to the associated device and a bus I/O interface adapted for signal connection to a signal bus, said ICU means exchanging signal data between said bus I/O interface and said device I/O interface, each of said ICU means transmitting and receiving signal data to and from said signal bus as serial bit digital signals, each of said ICU means further including an electrical power input;
signal bus means, having a data signal transmission line and an electrical power signal line, said data signal transmission line comprising two conductors adapted for connection to said bus I/O interface of each ICU means, and having a characteristic signal impedance, said electrical power signal line comprising two conductors including a high potential line and a low potential line, and adapted for connection between the system source of electrical power signals and said electrical power input of each ICU means, said signal bus means providing electrical power to each of said ICU means and providing a signal communicating path for exchanging said serial bit digital signals between said ICU means; and
impedance network means, one connected to each end of said signal bus transmission line, and having a signal impedance substantially equal to said characteristic signal impedance of said signal bus transmission line.

4,622,552
FACTORED MATCHED FILTER/FFT RADAR DOPPLER PROCESSOR

Grealie A. Andrews, Lanham, Md., and Samuel L. Sheller, Fairfax, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1984, Ser. No. 575,608
Int. Cl.[4] G01S *13/02*
U.S. Cl. 342—196 **4 Claims**



1. A Doppler processor device for processing radar signals to remove clutter contained therein, comprising:

N transversal filters coupled to receive said radar signals for filtering said radar signals to reduce the clutter components therein, each of said N transversal filters covering a different portion of the Doppler frequency spectrum of interest, each of said N transversal filters having a filter response matched to the spectrum of said clutter, each of said N transversal filters includes first fast Fourier transform means coupled to receive said radar signals for analyzing the spectrum of said radar signals to produce a power spectrum therefrom, second fast Fourier transform means coupled to receive the output of said first fast Fourier transform means for producing an intereference covariance matrix therefrom, matrix inversion means coupled to receive the output of said second fast Fourier transform means for producing an inverted intereference covariance matrix, signal vector generator means for generating a signal vector, complex conjugate circuit means for producing a complex conjugate of said signal vector; multiplier means coupled to receive said inverted interference covariance matrix and said complex conjugate of said signal vector for producing the product thereof as said weighting vector, weighting means coupled to receive said weight vector and said plurality of time-delayed radar signals for weighting said time-delayed radar signals in response to said weight vector to produce a plurality of weighted radar signals, and coherent summation means coupled to receive said plurality of weighted radar signals for combining said weighted radar signals in time coherency;

signal expansion means coupled to receive said radar signals and including at least one delay stage for separating said radar signals into a plurality of time-delayed radar signals; and

coherent integration filter means coupled to receive the output of said transversal filters for coherently integrating said output to further reduce clutter and noise components contained therein.

4,622,553
RADAR DETECTOR

Yoshihiko Baba, Noda, and Hiroshi Endo, Ichikawa, both of Japan, assignors to Uniden Corporation, Ichikawa, Japan

Filed Sep. 20, 1984, Ser. No. 652,468
Claims priority, application Japan, Sep. 20, 1983, 58-172261
Int. Cl.[4] H04B *1/00*
U.S. Cl. 342—91 **10 Claims**

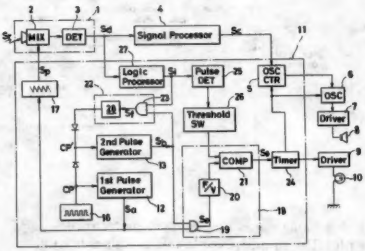
1. A radar detector, comprising:

a radar wave signal receiver for altering the frequency of incident radar wave signals, sweeping the signal resulting from said frequency alteration with a local oscillation frequency, and producing a detection signal when the radar wave signal is synchronized with the local oscillation frequency,

a first pulse train signal generator for producing pulses for sweeping said local oscillator frequency at fixed intervals,

a second pulse train signal generator for asynchronously producing a pulse train signal of a cycle different from the cycle of said first pulse train signal generator,

a cycle altering circuit for altering the cycle of said second pulse train signal generator with a logic output corresponding to the detection output of said radar wave signal receiver thereby synchronizing said cycle with the cycle of said first pulse train signal generator,



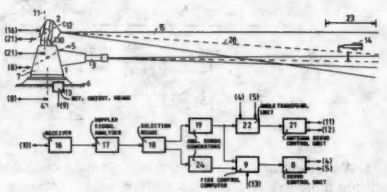
an asynchronism/synchronism detection circuit for monitoring the output pulses of said first and second pulse train signal generators and determining whether or not said two pulses coincide with each other at certain time intervals, and

a control circuit for enabling a synchronism detection signal produced by said asynchronism/synchronism detection circuit in consequence of absence of coincidence between the two output pulses from said first and second pulse train signal generators over a prescribed length of time to be validated into a serviceable form.

4,622,554
PULSE RADAR APPARATUS

Bernard Gellekink, Ootmarsum, and Hilbert Bisschop, Goor, both of Netherlands, assignors to 501 Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Jan. 11, 1984, Ser. No. 569,872
Claims priority, application Netherlands, Jan. 18, 1983, 8300178
Int. Cl.[4] G01S *13/86*
U.S. Cl. 342—67 **11 Claims**



1. A target tracking pulse radar apparatus for producing angular error data representing deviations of gun-fired projectiles from a target position line, at ranges including those corresponding to a target range gate, characterized in that said radar apparatus includes a low frequency signal processor comprising:

(a) a signal analyser having a FFT filter bank for determining Doppler spectral components of low-frequency-

detected echo signals received from the projectiles within the target range gate;

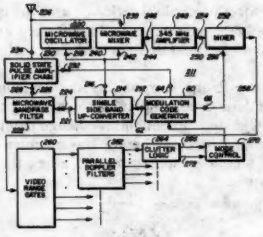
(b) selection means for selecting the projectile Doppler spectral components from the signal analyser;

(c) an angular error generator for generating said angular error data from the Doppler spectral components selected by the selection means, to effect gun aiming correction.

4,622,555
CODED PULSE DOPPLER RADAR WITH CLUTTER-ADAPTIVE MODULATION AND METHOD THEREFORE

John G. Doggett, Scottsdale; John M. Jones, and Ray O. Waddoups, both of Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 2, 1982, Ser. No. 414,158
Int. Cl.[4] G01S *13/26, 7/42*
U.S. Cl. 342—84 **6 Claims**



1. In conjunction with a pulse Doppler radar having a transmitter and receiver and wherein the phase/frequency of the transmitter is changed from pulse to pulse in accordance with a predetermined code, a method of clutter-adaptive modulation comprising the steps of:

monitoring the frequency spectrum of energy returned from a desired target and the frequency spectrum of energy returned from clutter;

providing a plurality of different codes, with the phase/frequency of the transmitter being changed from pulse to pulse at a different rate for each different code; and

selecting in response to the monitoring, a code from the pluralities provided such that the frequency spectrum of energy returned from a desired target is separated from the frequency spectrum of energy returned from clutter.

4,622,556
TECHNIQUE FOR RAPID DETERMINATION OF PROBABILITY OF DETECTION IN PULSE DOPPLER RADARS

Stephen M. Bryant, Baltimore, and Donald J. Speir, Columbia, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 2, 1984, Ser. No. 657,099
Int. Cl.[4] G01S *7/40*
U.S. Cl. 342—174 **7 Claims**

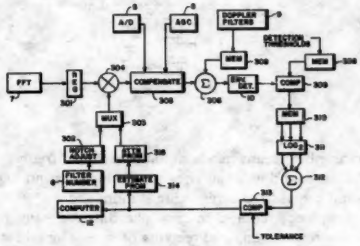
1. In combination with a pulse doppler radar system having a radar receiver with a plurality of range gates, with a signal processing system containing an analog-to-digital converter, a clutter filter, a fast Fourier transform, an automatic gain control circuit, a doppler filter bank and an envelope detector, said signal processing system being controlled by a system computer, a probability of detection system comprising:

a register storing and receiving a reference signal from said fast Fourier transform, said reference signal occuring when said system computer directs an input of a calibrated signal into said radar receiver, said register outputting said reference signal;

a first adjusting means receiving and adjusting said reference signal from said register by producing an adjusted reference signal being adjusted for saturation from said analog-to-digital converter, actions by said automatic gain control and notch adjustment from said clutter filter;

a first summing means receiving said adjusted reference signal from said first adjusting means, and vectorally adding said adjusting reference signal into said plurality of range gates of a selected doppler filter at the output of said doppler filter bank, said first summing means outputting a summed reference signal to said envelope detector resulting in an envelope detection signal;

a first comparison means receiving and comparing said envelope detection signal from said envelope detector, with a detection threshold from a first memory means in



said pulse doppler radar system, said first comparison means outputting a detection count for each integration period of said signal processing system;

a second memory means receiving said detection count from said first comparison means and outputting a first, second, third and fourth count signals, said first count signal equaling the detection count for the current integration period, the second and third count signals equaling the detection counts received from said first comparison means for the previous two integration periods, and the fourth count signal equaling the total number of range gates tested per integration period;

a calculation means receiving said count signals from said second memory means and calculating a probability of detection signal P_D wherein

$$P_D = \frac{(N_1 \times N_2 \times N_3)}{(N)^3}$$

where N_1, N_2 and N_3 equal respectively said first, second and third count signals, N equals said fourth count signal.

4,622,557
TRANSDIGITIZER FOR RELAYING SIGNALS FROM GLOBAL POSITIONING SYSTEM (GPS) SATELLITES

Edwin E. Westerfield, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 31, 1984, Ser. No. 666,784
Int. Cl.[4] H04B *7/185*
U.S. Cl. 342—357 **6 Claims**

1. A transdigitizer for receiving, downconverting and relaying signals from a satellite to a receiving station, said transdigitizer comprising:

a first antenna receiving and relaying said signals from said satellite;

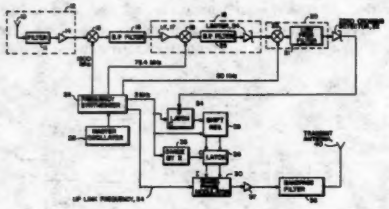
a radio frequency means receiving said signals from said first antenna, said radio frequency means filtering and amplifying said signal, said radio frequency means outputting a filtered signal;

a converter means receiving and converting said filtered

signal from said radio frequency means into an intermediate frequency signal;

an intermediate frequency means receiving, filtering and amplifying said intermediate frequency signal from said converted means, said intermediate frequency means outputting a filtered intermediate frequency signal;

a downconverter means receiving and downconverting said intermediate frequency signal into a base band frequency signal;



transmitter means receiving said base band frequency signal from said downconverter means and transmitting a transmit signal to said receiving station; and

a frequency control means coordinating said receiving, downconverting and relaying of signals by said transdigitizer by sending: a first clocking signal to said converter means, a second clocking signal to said intermediate frequency means, a third clocking signal to said downconverter means, and fourth and fifth clocking signals to said transmitter means.

4,622,558

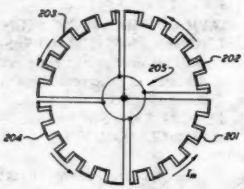
TOROIDAL ANTENNA

James F. Corum, Rte. 9, Box 207-B, Morgantown, W. Va. 26505

Continuation of Ser. No. 514,176, Jul. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 167,329, Jul. 9, 1980, abandoned. This application Nov. 7, 1985, Ser. No. 795,721

Int. Cl.[4] H01Q *11/14*

U.S. Cl. 343—742 **22 Claims**



11. A process for radiating or receiving electromagnetic energy comprising conducting first and second electrical currents, respectively, through first and second substantially closed, elongated conductors helically wound and disposed in bifilar relation on the same toroidal surface and establishing, in response to the flow of said currents, an electromagnetic wave along said surface in a condition of resonance.

4,622,559

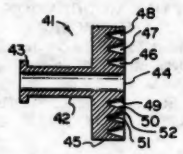
PARABOLOID REFLECTOR ANTENNA FEED HAVING A FLANGE WITH TAPERED CORRUGATIONS

Lotfollah Shafai; Ahmed A. A. Kishk; Ernest Bridges, and Apisak Ittipiboon, all of Winnipeg, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Apr. 12, 1984, Ser. No. 599,711

Int. Cl.[4] H01Q *13/02*

U.S. Cl. 343—786 **4 Claims**



1. A feed for a paraboloid reflector antenna comprising:

a circular waveguide having a longitudinal axis, a first end having an electrical coupler and a second radiating end; and

a conductive flange surrounding the radiating end of the waveguide and perpendicular to the longitudinal axis of the waveguide, said conductive flange having at least one corrugation therein wherein the corrugation has walls each of which is tapered inward along the depth of the corrugation.

4,622,560

LINE-WISE INTERFERENCE/BAND SUPPRESSION PRINTING SYSTEM

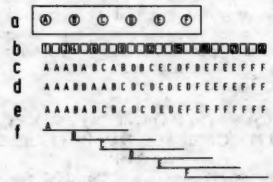
Wilhelmus H. C. Withoos; Petrus J. M. Leenders, both of Eindhoven; Franciscus H. C. Benning, Utrecht, and Johannes van de Meij, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 26, 1985, Ser. No. 759,544

Claims priority, application Netherlands, Jul. 26, 1984, 8402353

Int. Cl.[4] G01D *15/10;* **B41J** *3/10*

U.S. Cl. 346—1.1 **26 Claims**



1. A method for the line-wise printing of an image composed of an assembly of picture elements (pixels) by means of a printing head including a row of N ($N \geq 2$) printing elements arranged along an image line at a mutual distance from each other, said mutual distance being greater than the distance between two successive pixels in the same image line, the printing head being moved during a printing stroke in the direction of an image line to be printed, the method comprising: generating a first control signal for each pixel to be printed for the single-colour printing of that pixel, wherein the printing stroke is larger than the distance between two neighboring printing elements and for at least one strip of pixels which extends transversely to the image line direction and which for each image line contains several pixels which are each covered by $m (2 \leq m \leq N)$ printing elements, there is allocated to each pixel situated in the same image line and in such a strip one of said m printing elements, which allocation is achieved by printing a pixel situated later in the image line by means of a

printing element disposed earlier in the said row and by printing a pixel situated earlier in the image line by means of a printing element disposed later in the row, and each pixel being printed by energising the printing element allocated to it under the control of the respective first control signal.

4,622,561

IMAGE FORMING METHOD FOR DOT MATRIX PRINTER

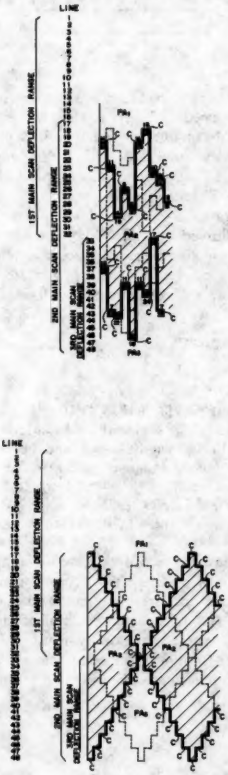
Takahisa Koike, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,273

Claims priority, application Japan, Apr. 10, 1984, 59-71489; Apr. 10, 1984, 59-71490

Int. Cl.[4] G01D *15/18;* H04N *1/23*

U.S. Cl. 346—1.1 4 Claims



1. An image forming method for a ink jet printer which prints out dots in a recording medium over a plurality of steps in a subscan direction by moving recording head means in a main scan direction relative to the recording medium and, every time a main scan completes, feeds the recording medium in the subscan direction relative to the recording head means, said image forming method comprising the steps of:

(a) providing mutually overlapping print areas during at least two consecutive main scans by selecting an amount of feed which is one half the width of the print line of the recording medim in the subscan direction;

(b) subdividing an overlapping region of the print areas into a plurality of subregions; and

(c) determining by which one of main scans performed by the recording head means each of the subregions should be printed out;

whereby a boundary portion between the nearby print areas each being provided by a main scan is free from deterioration of image quality.

4,622,562

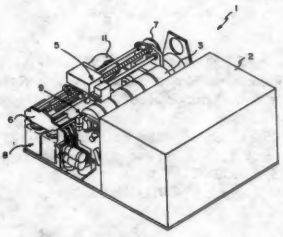
INK JET PRINTHEAD MULTI-COMPONENT HEATING

David N. Pipkorn, Centerville, and Robert G. Leen, Kettering, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,547

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—75 3 Claims



1. In continuous ink jet printing apparatus of the type having means for generating an ink droplet stream(s) from ink supplied thereto, a charge plate having an electrode(s) for selectively imparting electrical charge to droplets of such stream(s) and catcher means for catching a portion of such droplets in response to the charging or non-charging thereof, the improvement wherein said charge plate and said catcher means are physically coupled for conductive transfer of thermal energy and comprising heater means in said catcher means for heating the operative surfaces of both said charge plate and said catcher menas to a temperature preventing condensation of ink vapors.

4,622,563

PRINTING APPARATUS WITH MULTIPLE RIBBON CASSETTES HOLDER

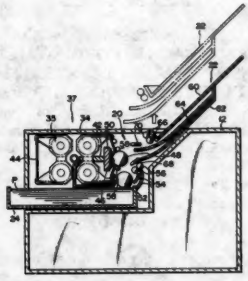
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 2, 1984, Ser. No. 627,298

Claims priority, application Japan, Jul. 5, 1983, 58-121774; Jul. 15, 1983, 58-128921; Jul. 18, 1983, 58-130512

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH 15 Claims



1. A printing apparatus which is loaded with a transfer member and a spare transfer member including a color agent to

be transferred to a sheet, and which transfers the color agent to the sheet in accordance with a pattern to form an image on the sheet, comprising:

a housing having a transferring function;

mounting means in the housing for mounting the transfer member in the position where the color agent can be transferred to the sheet in accordance with the pattern; and

holding means formed integrally with the housing and located close the mounting means for holding the spare transfer member, wherein said holding means includes a holder for simultaneously and rotatably holding the transfer member to be attached to the mounting means and the spare transfer member to be attached to the holding means in back to back relationship so that the transfer members held by the holder can be replaced with each other by rotating the holder through approximately 180 degrees.

4,622,564

OPTICAL INFORMATION RECORDING APPARATUS

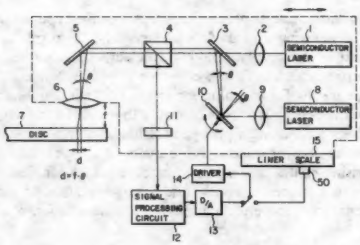
Toshimitsu Kaku, Sagamihara; Takeshi Nakao, Kukubunji, and Yoshito Tsunoda, Mitaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,690

Claims priority, application Japan, Dec. 14, 1983, 58-234250; Dec. 21, 1983, 58-239747

Int. Cl.⁴ G01D *15/06, 9/42*

U.S. Cl. 346—160 **16 Claims**



1. An optical information recording apparatus comprising:

means for generating a plurality of light beams;

optical means for focusing the plurality of light beams on a track of a predetermined disc so as to irradiate a plurality of light spots on different positions along the track;

means for varying the center position of at least one of said plurality of light spots in a direction along said track;

means for detecting the position of said at least one of said plurality of light spots in the radial direction of said disc; and

means responsive to the output signal from said position detecting means, for controlling said varying means.

4,622,565

MULTI-COLORED IMAGE RECORDING METHOD AND THERMOSENSITIVE IMAGE TRANSFER SHEET FOR USE IN THE RECORDING METHOD

Hideo Watanabe; Kanjiro Kawasaki, both of Numazu; Keishi Kubo, Yokohama; Minoru Hakiri, and Nobuhiro Takigawa, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,513

Claims priority, application Japan, Feb. 1, 1984, 59-18103

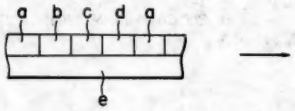
Int. Cl.⁴ B41M *5/18*

U.S. Cl. 346—201 **16 Claims**

1. A method for recording a multicolored image, comprising the steps of:

superimposing on a receiving sheet a thermosensitive image transfer sheet including four leuco dye layers respectively containing yellow, magenta, cyan and black leuco dyes that can be respectively colored in yellow, magental, cyan and black, and a color developer layer containing a color developer capable of inducing the said respective color formation in the said leuco dyes when the said color developer reacts with the said leuco dyes under application of heat thereto, wherein the said leuco dyes layers and the said color developer layer are separately positioned side-by-side on the said thermosensitive image transfer sheet;

applying heat selectively to the portions of the said thermosensitive image transfer sheet corresponding to the said leuco dyes layers and the said color developer layer in accordance with desired color tone information; and



(1) transferring the said leuco dyes from the said selectively heated leuco dyes layers to the said receiving sheet in a side-by-side or overlapping way in accordance with the desired color tone information, followed by transferring the said color developer onto the said transferred leuco dyes on said receiving sheet; or

(2) transferring the said color developer to the said receiving sheet, followed by transferring the said leuco dyes from the said selectively heated leuco dye onto the said transferred color developer layers in a side-by-side or overlapping way in accordance with the desired color tone information.

4,622,566

HEAT-SENSITIVE RECORDING MATERIAL

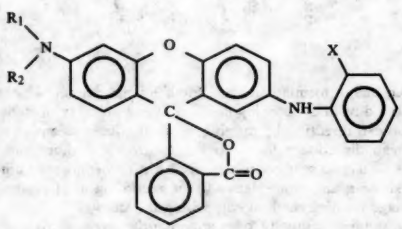
Norikazu Kasamatsu, Kawasaki; Masao Matsukawa, Tokyo; Hirokazu Hirata, Kamifukuoka, and Masaru Mishima, Tokyo, all of Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 760,120

Int. Cl.⁴ B41M *5/18*

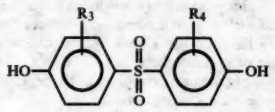
U.S. Cl. 346—214 **2 Claims**

1. A heat-sensitive recording material comprising a support having thereon a heat-sensitive, color-forming layer mainly composed of as color-forming components a colorless or pale-colored leuco dye and an acidic compound capable of allowing said leuco dye to color develop by heating, wherein said heat-sensitive, color-forming layer comprises a color former comprising a fluoran derivative represented by the following general formula (I):



(I)

wherein R_1 and R_2 each represents a lower alkyl group, and X represents a halogen atom, a lower alkyl group, a cyano group, or a nitro group, a developer comprising bis(p-hydroxyphenyl)sulfone or a derivative thereof represented by the following general formula (II):



(II)

wherein R_3 and R_4 each represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, a phenoxy group, a carbonyl group, a nitro group, or a cyano group, and a binder comprising an ammonium salt of a diisobutylene/maleic anhydride copolymer and a styrene/butadiene copolymer.

4,622,567

INTEGRATED FET DEVICE HAVING MULTIPLE OUTPUTS

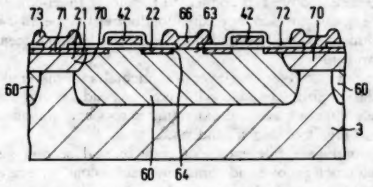
Jan A. Pals, Eindhoven, and Arend J. Klinkhamer, Nijmegen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1984, Ser. No. 607,334

Claims priority, application Netherlands, May 9, 1983, 8301629

Int. Cl.⁴ H01L *29/78, 27/02*

U.S. Cl. 357—23.1 **9 Claims**



1. A semiconductor device comprising an integrated circuit provided at a surface of a semiconductor body of one conductivity type, constructed in accordance with insulated gate field effect device technology and having a plurality of output stages with output amplifiers for converting signals, each output stage having an input for supplying a signal and an output for deriving the transformed signal, a separate surface-adjoining surface region of the second conductivity type for each output stage provided in said semiconductor body, an insulated gate field effect transistor formed in said surface-adjoining surface region and comprising a surface-adjoining source zone of the one conductivity type located entirely within the surface region and provided with a source contact which is also directly connected to the surface region, a surface-adjoining drain zone of the one conductivity type which is located only in part in the surface region and extends beyond the edge of the surface region into the part of the semiconductor body of the one conductivity type surrounding the surface region, and an insulated gate connected to the input of the output stage, the source contact being connected to the output of the output stage.

4,622,568

PLANAR FIELD-SHAPED BIDIRECTIONAL POWER FET

Herman P. Schutten, Milwaukee; James A. Benjamin, Waukesha, both of Wis., and Robert W. Lade, Fort Myers, Fla., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 9, 1984, Ser. No. 608,402

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **19 Claims**

1. A planar, lateral, bidirectional power FET having a common drift region between a pair of spaced first and second channel-containing regions and first and second source regions, a field shaping region forming a junction with said drift region opposite the portion of said drift region between said channel-containing regions and extending symmetrically thereacross, and means for controlling the potential of said field shaping region such that during the OFF state of said FET said field shaping region straightens field lines and prevents gradient induced depletion and unwanted inversion of conductivity type along said drift region portion between said channel-containing regions,

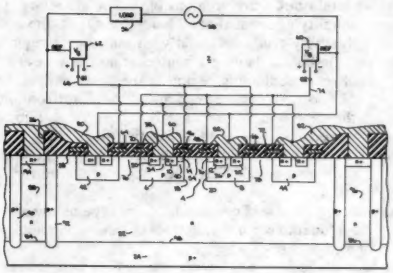
wherein:

said first source region is of one conductivity type semiconductor material;

said first channel-containing region is of opposite conductivity type semiconductor material and forms a junction wth said first source region;

said drift region is of said one conductivity type semiconductor material and forms another junction with said first channel-containing region;

said second channel-containing region is of said opposite conductivity type semiconductor material and forms a junction with said drift region;



said second source region is of said one conductivity type semiconductor material and forms a junction with said second channel-containing region;

said field shaping region is of said opposite conductivity type semiconductor material;

and comprising gate electrode means including a first portion disposed proximate the first channel and a second portion disposed proximate the second channel, and adapted for application of electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said first and second channels;

whereby upon application of voltage of either polarity to said first and second source regions, electric current can flow in a respective corresponding direction between them, under control of said electrical potential of said gate electrode means;

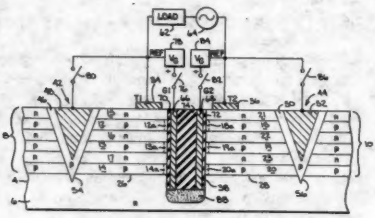
and wherein said means for controlling the potential of said field shaping region comprises steering means for referencing said field shaping region to substantially the same potential as one of said source regions for one polarity voltage applied to said first and second source regions, and to substantially the same potential as the other of said source regions for the other polarity voltage applied to said first and second source regions.

4,622,569

LATERAL BIDIRECTIONAL POWER FET WITH NOTCHED MULTI-CHANNEL STACKING AND WITH DUAL GATE REFERENCE TERMINAL MEANS

Robert W. Lade, Fort Myers, Fla.; James A. Benjamin, Waukesha, and Herman P. Schutten, Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 8, 1984, Ser. No. 618,537
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.4 **4 Claims**



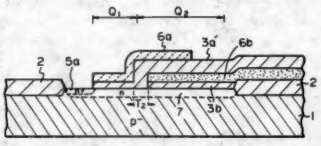
1. A bidirectional FET comprising in a semiconductor body:
a first stack of alternating conductivity type layers comprising:
a plurality of source regions of one conductivity type;
a plurality of channel-containing regions of opposite conductivity type inteleaved with said source regions;
said first stack having a source region at one end and a channel-containing region at the other end, said layers of said first stack extending laterally horizontally, and the direction of stacking being vertical, said source region at said one end of said first stack being at the top of the latter, said channel-containing region at said other end of said first stack being at the bottom of the latter;
a drift region of said one conductivity type below and forming a junction with said bottom channel-containing region of said first stack;
a second stack of alternating condutivity type layers comprising:
a plurality of source regions of one conductivity type;
a plurality of channel-containing regions of opposite conductivity type interleaved with said last mentioned source regions;
said second stack having a source region at one end and a channel-containing region at the other end, said layers of said second stack extending laterally horizontally, and the direction of stacking being vertical, said source region at said one end of said second stack being at the top of the latter, said channel-containing region at said other end of said second stack being at the bottom of the latter and forming a junction with said drift region therebelow;
a notch extending downwardly between and separating said first and second stacks and extending into said drift region, said stacks being laterally spaced by said notch therebetween;
insulated gate electrode means in said notch proximate said channel-containing regions and adapted for application of electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said channel-containing regions to said one conductivity type to induce conduction channels therethrough between said source regions and enable a bidirectional current conduction path through said drift region and through said stacks between said top source regions, the conductive current path in one direction traversing serially through the layers of one stack along one side of said notch then through said drift region around the bottom of said notch then serially through the layers of the other stack along the other side of said notch, the conductive current path in the opposite direction traversing serially through the layers of said other stack along said other side of said notch then through said drift region around the bottom of said notch then serially through the layers of said one stack along said one side of said notch;
gate voltage supply means for applying said potential to said gate electrode means in said notch;
a first main electrode connected to said top source region of said second stack;
a second main electrode connected to said top source region of said second stack;
a first gate reference groove notched vertically into said first stack;
first gate reference terminal means in said first gate reference groove and connected to said channel-containing regions of said opposite conductivity type in said first stack, said first gate reference terminal means comprising:
a first gate reference layer of semiconductor material of said opposite conductivity type in said first gate reference groove and extending across and contacting said layers of said first stack;
a first gate electrode in said first gate reference groove and contacting said first gate reference layer of semiconductor material of said opposite conductivity type;
a second gate reference groove notched vertically into said second stack;
second gate reference terminal means in said second gate reference groove and connected to said channel-containing regions of said opposite conductivity type in said second stack, said second gate reference terminal means comprising:
a second gate reference layer of semiconductor material of said opposite conductivity type in said second gate reference groove and extending across and contacting said layers of said second stack;
a second gate reference electrode in said second gate reference groove and contacting said second gate reference layer of said opposite conductivity type;
means ohmically connecting said gate voltage supply means to said first and second gate reference electrodes to reference said gate voltage supply means to each of said first and second gate reference terminal means.

4,622,570

SEMICONDUCTOR MEMORY

Masao Taguchi, Sagamihara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 218,801, Dec. 22, 1980. This application Jun. 1, 1984, Ser. No. 615,675
Claims priority, application Japan, Dec. 24, 1979, 54-167828
Int. Cl.[4] H01L *29/78, 27/02, 29/04*; G11C *11/34*
U.S. Cl. 357—23.6 **18 Claims**



1. A semiconductor memory device of a one-transistor type, comprising:
a semiconductor substrate of a first conductivity type and having a work function, comprising:
a first impurity doped region of a second conductivity type opposite the first conductivity type; and
a second impurity doped region of the second conductivity type formed within said first impurity doped region, said second impurity doped region having a higher

concentration of impurities than said first impurity doped region;

a first insulating layer disposed over a portion of said first impurity doped region;

a first conductive layer disposed on said first insulating layer and having a first work function different from the work function of said semiconductor substrate, the difference between the first work function and the work function of said semiconductor substrate being determined so that a depletion region in said semiconductor substrate under said first conductive layer covers only part of said first impurity region under said first conductive layer when a first predetermined voltage is applied to said first conductive layer;

a second insulating layer having a thin portion disposed directly on said first impurity doped region and having a thick portion extending over said first conductive layer;

a second conductive layer disposed on said second insulating layer and having a second work function different from the work function of said semiconductor substrate, the difference between the second work function and the work function of said semiconductor substrate being determined so that the depletion region of said semiconductor substrate under said second conductive layer substantially completely covers said first impurity region under said second conductive layer, when a second predetermined voltage is applied to said second conductive layer;

a buried-channel normally-off type transistor having a source and drain corresponding to said second and first impurity doped regions, respectively, having a channel corresponding to said first impurity doped region, formed directly below said thin portion of said second insulating layer, and having a gate electrode corresponding to said second conductive layer; and

a normally-on type capacitor comprising a first electrode corresponding to said first impurity doped region and a second electrode corresponding to said first conductive layer.

4,622,571

CMOS INTEGRATED CIRCUIT DEVICE

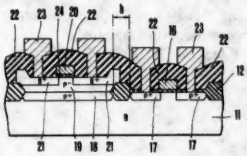
Toshio Hara, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 466,906, Feb. 16, 1983, abandoned. This application Jan. 24, 1986, Ser. No. 822,919

Claims priority, application Japan, Feb. 18, 1982, 57-25404

Int. Cl.⁴ H01L *27/02*

U.S. Cl. 357—42 **6 Claims**



1. A CMOS integrated circuit device comprising:

a semiconductor substrate of a first conductivity type having a first and second region in closely adjacent relationship with each other;

a field insulating film formed on said substrate to isolate and surround said first and second regions;

a first MOS transistor constructed on said first region, said first MOS transistor including,

a first drain layer and a first source layer, each being of a second conductivity type which is opposite to the first conductivity type, one of the first drain and the first source layers being disposed near said second region and another one being separated from said one of them by a part of said substrate,

a first gate insulating film formed on said first drain and first source layers and said part of the substrate therebetween,

a first gate layer formed on said first insulating film, and

first metal wiring layers which are formed substantially perpendicular to the substrate and connected with said first drain and source layers, respectively, through corresponding first through holes formed in said first gate insulating film;

a low resistance layer of the second conductivity type formed on the entire second region of said substrate;

an expitaxial layer which is of the second conductivity type and has a high resistance formed on said low resistance layer to cover the entire second region surrounded by said field insulating film;

a second MOS transistor constructed on said epitaxial layer, said second MOS transistor including,

a second drain layer and a second source layer, each being of the first conductivity type, one of the second drain and second source layers being disposed near said first region, and another one being separated from said one of said second drain and source layers by a part of said epitaxial layer,

a second gate insulating layer formed on said second drain and second source layers and said part of the epitaxial layer therebetween,

a second gate layer formed on said second insulating film, and

second metal wiring layers which are formed substantially perpendicular to the substrate and connected with said second drain and source layers, respectively, through corresponding second through holes formed in said second gate insulating film; and

an insulating film formed on said first and second MOS transistors and said field insulating film to cover the entire surface of the device retaining said metal wiring layer projected from the surface of the device.

4,622,572

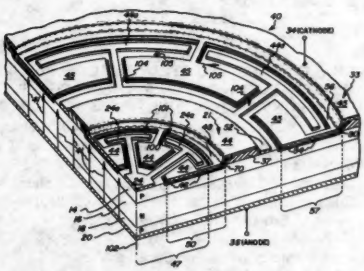
HIGH VOLTAGE SEMICONDUCTOR DEVICE HAVING AN IMPROVED DV/DT CAPABILITY AND PLASMA SPREADING

Victor A. K. Temple, Jonesville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 290,132, Aug. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 152,742, May 23, 1980, abandoned. This application Dec. 6, 1982, Ser. No. 446,841

Int. Cl.⁴ H01L *29/74*

U.S. Cl. 357—38 **9 Claims**



1. A high voltage semiconductor device comprising:

an upper surface, a first cathode region including a first metallization layer and a first emitter region thereunder on said upper surface, a second cathode region including a

second metallization layer and a second emitter region thereunder and separated by a distance from said first cathode region; said first and second emitter regions being of one conductivity type, a gate adapted to receive an applied signal; and an anode; said first cathode having a turn-on line approximately located at a leading edge of said first emitter region with respect to said gate; said second cathode having a turn-on line located approximately at a leading edge of the emitter region thereof with respect to said gate; said first and second cathodes being separated from said anode by a plurality of layers of alternating conductivity-type material, a first layer of said layers of alternating conductivity-type material being of opposite conductivity type and forming a portion of said upper surface and a junction with said first and second emitter regions, said gate electrode contacting said first layer of said layers of alternating conductivity-type material and said first and second cathodes being coupled to each other and to said gate by said first layer of said layers of alternating conductivity-type material; said second cathode and said anode being adapted to be coupled between opposite ends of a relatively high voltage potential source having periodic relatively high voltage transients so that periodic occurrences of the voltage transients generate capacitive charging currents within said layers of alternating conductivity-type material, said high voltage semiconductor device further comprising:

capacitive means for diverting a portion of transient generated capacitive charging currents flowing within said layers of alternating conductivity-type material beneath said gate away from said first and second emitter regions and the portion of said first layer lying thereunder, such that the transient generated capacitive charging currents which are manifested as the gate current are reduced with minimal effect on other parameters of said device, thereby improving the dv/dt capability of said device;

said capacitive means comprising:

a first insulating layer disposed within said first emitter region of said first cathode and a portion of said first layer adjacent a leading edge of said first emitter region and overlapping the turn-on line of said first cathode, said first metallization layer contacting said first emitter region and including a first metallization extension overlying said first insulating layer and also overlying said leading edge of said first emitter region and overlapping said turn-on line thereof without directly contacting said first layer; and a second insulating layer disposed within said second emitter region of said second cathode and a portion of said first layer adjacent a leading edge of said second emitter region and overlapping the turn-on line of said second cathode, said second metallization contacting said second emitter region and including a second metallization extension overlying said second insulating layer and also overlying said leading edge of said second emitter region and overlapping said turn-on line thereof.

4,622,573

CMOS CONTACTING STRUCTURE HAVING DEGENERATIVELY DOPED REGIONS FOR THE PREVENTION OF LATCH-UP

Paul E. Bakeman, Jr., Shelburne, and Henry J. Geipel, Jr., Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 481,023, Mar. 31, 1983, abandoned. This application Feb. 18, 1986, Ser. No. 831,098

Int. Cl.[4] H01L *29/78, 29/88*

U.S. Cl. 357—42 **7 Claims**

7. A semiconductor device comprising:

a semiconductor body of a first conductivity type;

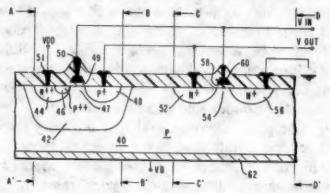
a well region of a second conductivity type formed in said semiconductor body;

a first semiconductor region of a first conductivity type formed in said well region;

a second degeneratively doped semiconductor region of a second conductivity type and a third degeneratively doped semiconductor region of a first conductivity type forming a junction tunnel diode in said well region, said third degeneratively doped semiconductor region and said first semiconductor region defining a channel region therebetween, said second degeneratively doped semiconductor region contiguously disposed to and surrounding said third degeneratively doped semiconductor region outside said channel region, said second degeneratively doped semiconductor region having an area which is larger than said third degeneratively doped semiconductor region;

a first insulating layer disposed above said channel region of said semiconductor body;

a first gate electrode disposed above said first insulating layer forming with said first insulating layer and said first and third semiconductor regions a first FET;



fourth and fifth semiconductor regions of a second donductivity type formed in a surface area of said semiconductor body;

a second insulating layer disposed adjacent said substrate and between said fourth and fifth semiconductor regions;

a second gate electrode disposed adjacent said second insulating layer and said fourth and fifth semiconductor regions a second FET

means for interconnecting said first and second FET's to form a CMOS circuit arrangement;

means for biasing said junction tunnel diode such that said second degeneratively doped semiconductor region is at a potential of no more than 100 millivolts in excess of that of said third degeneratively doped semiconductor region, in order to operate said tunnel diode as a low absolute value ohmic resistor to prevent latch-up of said CMOS circuit arrangement.

4,622,574

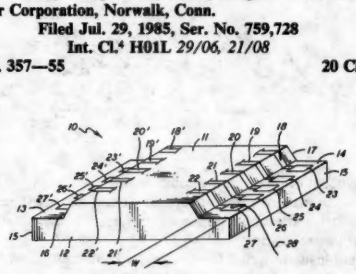
SEMICONDUCTOR CHIP WITH RECESSED BOND PADS

Enrique Garcia, Sandy Hook, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 29, 1985, Ser. No. 759,728

Int. Cl.[4] H01L *29/06, 21/08*

U.S. Cl. 357—55 **20 Claims**



1. A semiconductor chip having a top surface portion containing active circuitry, wherein the improvement comprises:

a peripheral ledge portion being recessed between 50 micrometers and 150 micrometers below the top surface portion of the chip;

a sloped wall portion intermediate said top portion of the chip and said peripheral ledge portion;

at least one bond pad means provided on said peripheral ledge portion; and

leadout line means for electrically connecting the active circuitry with said bond pad.

13. An electrostatic charge-sensing apparatus as in claim 12 wherein the gap is nominally 10 micrometers.

4,622,575

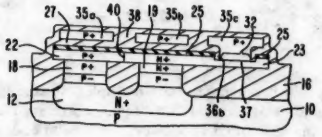
INTEGRATED CIRCUIT BIPOLAR MEMORY CELL

Madhukar B. Vora, Los Gatos, and William H. Herndon, Sunnyvale, both of Calif., assignors to Fairchild Semiconductor Corporation, Cupertino, Calif.

Division of Ser. No. 315,678, Oct. 27, 1981. This application Sep. 4, 1984, Ser. No. 647,315

Int. Cl.⁴ H01L *29/04, 27/02, 29/70*

U.S. Cl. 357—59 **14 Claims**



1. A memory cell comprising:

a semiconductor body including first and second bipolar transistors, each transistor including a base, a collector, and an emitter;

the base of the first transistor being connected by a first connection to the collector of the second transistor and the collector of the first transistor being connected by a second connection to the base of the second transistor, the first and second connections including first and second spaced-apart strips of semiconductor material disposed on the semiconductor body;

third and fourth spaced-apart strips of semiconductor material disposed across the first and second strips to contact the semiconductor body, but electrically isolated from the first and second strips; and

first and second diode regions of semiconductor material disposed on selected portions of the respective first and second strips to contact the strips, the first and second diode regions being of opposite conductivity type to the selected portions of the first and second strips.

4,622,576

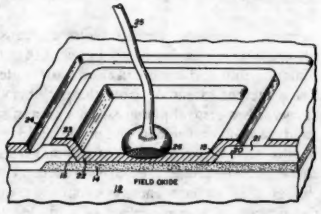
CONDUCTIVE NON-METALLIC SELF-PASSIVATING NON-CORRODABLE IC BONDING PADS

Matthew S. Buynoski, Palo Alto, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 22, 1984, Ser. No. 663,653

Int. Cl.⁴ H01L *23/48*

U.S. Cl. 357—71 **5 Claims**



1. A bonding pad structure for use with monolithic silicon integrated circuit devices, said devices including a silicon substrate having active and passive circuit elements fabricated therein, a passivating field oxide located thereon, and a plurality of metal bonding pads by means of which connections to said active and passive circuit elements are made, said bonding pad structure comprising:

a metal pad layer located on top of said field oxide and having a peripheral edge;

a first passivation layer located on top of said metal pad layer, substantially covering said integrated circuits and having an opening with an edge lying inside said peripheral edge of said metal pad layer; and

a second non-metallic, self-passivating conductive coating located on top of said first passivating layer covering said opening in said first passivation layer, substantially covering said integrated circuits and having a moat therein located outside the periphery of said edge of said opening in said first passivation layer whereby said metal pad layer is covered by said second conductive coating.

4,622,577

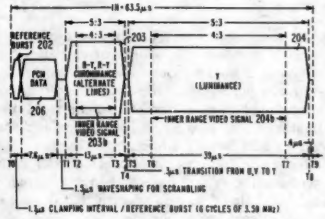
DECODER FOR EXTRACTING A 4:3 ASPECT RATIO SIGNAL FROM A HIGH DEFINITION TELEVISION SIGNAL

Glenn A. Reitmeier, Trenton, and Curtis R. Carlson, Princeton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 3, 1984, Ser. No. 576,915

Int. Cl.⁴ H04N *11/20*

U.S. Cl. 358—11 **4 Claims**



2. A variable aspect ratio television display apparatus, comprising:

input means for receiving a video input signal of time division multiplexed form having line and field rates conforming to a given broadcast standard, each active line thereof comprising time-sequential time-compressed luminance and chrominance components representative of an image having an aspect ratio which may vary between a standard 4:3 ratio and a higher wide-screen ratio;

a source for providing an aspect ratio control signal;

memory means having a write mode for sequentially storing said components of a given line in respective separate locations and having a read mode for recovering the stored components simultaneously during an immediately following line interval and for concurrently time expanding the recovered components by selected expansion factors;

memory control means coupled to said memory means for controlling said expansion factors such that for a first condition of said control signal said memory means expands only a central portion of said components and under a second condition said memory means also expands end portions of said components, wherein for either conditional said components are expanded so as to be in time registration with each component conforming to a standard active line interval of said given broadcast standard;

display means coupled to said memory means and synchronized with said video input signal for displaying said

expanded components at said given line and field rates with said standard aspect ratio of 4:3; and

circuit means in said memory control means for varying the frequency and timing of a write clock as a function of said control signal such that the number of samples stored is independent of said aspect ratio of said video input signal.

4,622,578

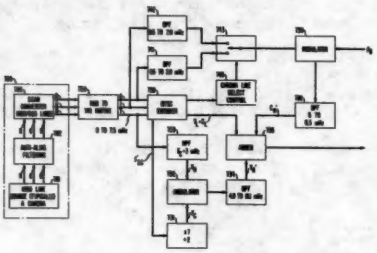
FULLY COMPATIBLE HIGH DEFINITION TELEVISION

Theodore S. Rzeszewski, Lombard, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 462,065, Jan. 28, 1983, abandoned. This application Feb. 23, 1984, Ser. No. 583,099

Int. Cl.[4] H04N *11/06, 11/14*

U.S. Cl. 358—12 **12 Claims**



1. A method of generating a high resolution baseband video signal from a line-scanning source of anti-alias filtered video signals having a number of scanning lines per frame and a bandwidth adequate to provide the desired degree of vertical and horizontal resolution, comprising the steps of

modulating a high-pass filtered portion of said source signals with a signal having a frequency that is a multiple of the frequency of the chrominance subcarrier embedded in a lower portion of said baseband source signals to produce a sideband signal having spectra that do not overlap the spectra of said lower portion,

multiplexing among successive horizontal lines only the band-limited high-frequency portions of the color signal contained in said source signals,

modulating said multiplexed band-limited color signal with a carrier signal to provide a single-sideband color spectrum that non-interferingly interleaves the high-frequency luminance spectra of said produced sideband signal and the modulated multiplexed color signal, and

combining said produced sideband signal with said lower portion of said baseband signals.

4,622,579

METHOD AND APPARATUS FOR TRANSMITTING DIGITAL LUMINANCE AND CHROMINANCE TELEVISION SIGNALS

Alexander Starck, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 10, 1984, Ser. No. 598,681

Claims priority, application Fed. Rep. of Germany, May 10, 1983, 3317115

Int. Cl.[4] H04N *5/38, 11/02, 7/13*

U.S. Cl. 358—13 **7 Claims**

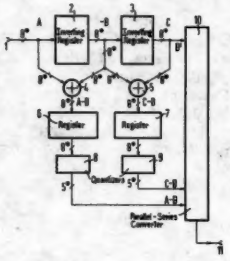
1. A method for transmitting digital luminance and chrominance television signals generated in the form of a sequence of PCM codewords containing scan values for each image row comprising the steps of:

selecting PCM codewords in a pattern in said sequence;

generating a DPCM codeword on both sides of each selected PCM codeword at least in the horizontal direction, said DPCM codewords being formed from the difference between a current selected PCM codeword and the PCM codeword occurring directly horizontally, vertically, or diagonally adjacent thereto;

interleaving said PCM codewords and said DPCM codewords image row-by-image row to form a first time division multiplex signal;

transmitting said first time division multiplex signal;



receiving said first time division multiplex signal and separating said PCM and said DPCM codewords at a receiver;

reconverting said DPCM codewords into PCM codewords; and

interleaving the unchanged received PCM codewords and the reconverted DPCM codewords image row-by-image row to form a second time division multiplex signal.

4,622,580

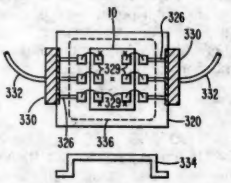
SOLID-STATE IMAGER CHIP MOUNTING

Peter A. Levine, Trenton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 26, 1984, Ser. No. 654,556

Int. Cl.[4] H04N *9/09, 9/04*

U.S. Cl. 358—50 **15 Claims**



1. A solid-state imager assembly comprising:

a solid-state imager chip including a substrate having selective doping and an electrode structure on a side thereof for developing an imaging area on one side of said imager chip;

a solid element comprising a radiant energy transmissive material, said element having an area greater than the area of said imager chip and a metallization pattern deposited on one side thereof extending from the periphery of said element towards a central planer surface area of said one side of said element, said side of said imager chip including said imaging area being attached in a facing relation to said central planer surface area of said element so as to allow imaging of radiant energy which is transmitted through said central planer surface of said element onto said imaging area of said imager chip; and

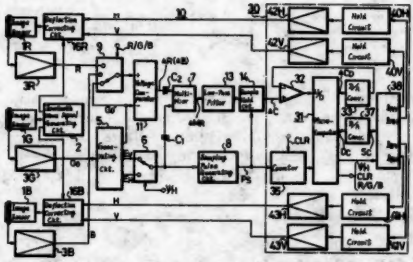
means for electrically connecting the electrode structure of said chip to said metallization pattern.

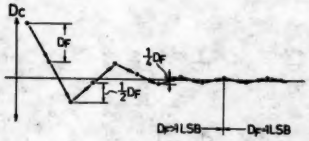
4,622,581

VIDEO CAMERA CONTROL CIRCUIT AVERAGING CONTROL SIGNALS EACH OBTAINED BY ADDING OR SUBTRACTING A PREVIOUS CONTROL SIGNAL AND REFERENCE CORRECTING DATA IN RESPONSE TO ERROR DATA, WITH THE REFERENCE CORRECTING DATA BEING REDUCED FOR EACH POLARITY REVERSAL

Taku Kihara, and Takashi Nakamura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 19, 1984, Ser. No. 652,084
Claims priority, application Japan, Sep. 22, 1983, 58-175427
Int. Cl.[4] H04N 9/093
U.S. Cl. 358—51 5 Claims





1. An automatic control circuit for a controlled circuit of a video camera comprising:

an error detecting circuit for detecting and generating error data;

control signal generator means supplied with said error data for generating an averaged control signal; and

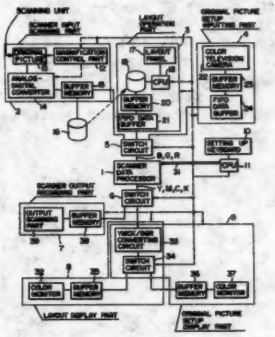
a control circuit supplied with said averaged control signal for controlling said controlled circuit in the video camera, said control signal generator means mixes reference correcting data with an interim control signal in a manner determined by said error data thereby to generate a new control signal, and said control signal generator means includes means for changing the polarity of said reference correcting data and decreasing the absolute value of said reference correcting data when said error data changes its polarity, and means for averaging a plurality of the control signals each of which is generated when said reference correcting data is at its minimum value and said error data changes its polarity, the output of said averaging means being said averaged control signal.

4,622,582

ASYNCHRONOUS COLOR IMAGE PROCESSING SYSTEM WITH A PLURALITY OF PICTURE INPUT UNITS AND A PLURALITY OF PICTURE REPRODUCING UNITS SELECTED IN ACCORDANCE WITH A PREDETERMINED ORDER OF PREFERENCE

Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jan. 9, 1984, Ser. No. 569,393
Int. Cl.[4] G03F 3/08; H04N 1/46, 1/20, 1/40
U.S. Cl. 358—80 4 Claims



1. A color separation system comprising:

a plurality of picture input units, each unit supplying a set of color-separated picture signals corresponding to color components to be subjected to color tone conrols;

a scanner data processor for selectively receiving a set of color-separated picture signals from one of the plurality of picture input units and containing at least one set of look-up tables adapted to carry out desired color tone controls on the thus-received set of color-separated picture signals;

a pluraltiy of picture reproducing units, each unit for reproducing a permanent or temporary picture;

at least one central processing unit adapted to selectively control the distribution of a processed set of color-separated picture signals from the scanner data processor to one of the plurality of reproducing units so as to obtain a reproduced permanent or temporary picture; and

a plurality of data registers corresponding to said plurality of picture input units which supply said look-up tables with data used to perform color tone controls on color-separated picture signals from the plurality of picture input units;

wherein a set of color-separated picture signals is selected for input to said scanner data processor in accordance with a predetermined order of preference among the plurality of picture input units.

4,622,583

AUDIENCE RATING MEASURING SYSTEM

Fumio Watanabe, Zama, and Yoshikazu Itoh, Kunitachi, both of Japan, assignors to Video Research Limited, Tokyo, Japan

Filed Dec. 17, 1984, Ser. No. 682,104
Claims priority, application Japan, Jul. 10, 1984, 59-143052
Int. Cl.[4] H04N 17/04, 17/06; H04H 9/00
U.S. Cl. 358—84 2 Claims

1. An audience rating measuring system for use with a video tape recorder including a recording circuit, a playback circuit, and a power source and which is characterized by off mode, monitor mode, play-back mode and recording mode and for use with a television set including a power source, said system comprising: record detection means which detects frequency-modulated video signals from the recording circuit of said

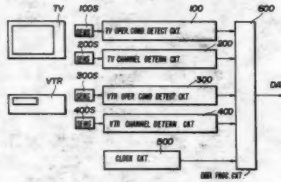
video tape recorder and which converts the video signals into direct currents;

play-back detection means which detects frequency-modulated video signals from the play-back circuit of said video tape recorder and which converts the video signals into direct currents;

power-source detection means which detects the turning on and off of the power source of said video tape recorder and of said television set; and

circuit means coupled to said record detection means, play-back detection means, and power-source detection means for detecting the operation of the video tape recorder, to determine whether the operation condition of the video tape recorder is in said off mode, monitor mode, play-back mode or recording mode.

2. An audience rating measuring system for use with a video tape recorder including a recording circuit and a tuner and which is c characterized by ordinary broadcast and dubbing modes and with a television set, said system comprising:



record detection means which detects frequency-modulated video signals from the recording circuit of said video tape recorder and which converts the video signals into direct currents;

FM demodulation means which demodulates said frequency-modulated video signals to obtan video signals;

detection means which detects video intermediate-frequency signals from the tuner of said video tape recorder to obtain video signals;

comparator means which directly compares the video signals obtained from said FM demodulation means with the video signals obtained from said detection means to determine whether they are in agreement; and

circuit means coupled to said detection means and comparator means and which determines whether a record is of said ordinary broadcast or dubbing modes, relying upon the detection conditions of said record detection means and said comparator means.

4,622,584

AUTOMATIC DIMMER FOR ENDOSCOPE

Tatsuo Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

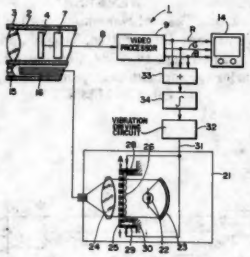
Filed Sep. 5, 1984, Ser. No. 647,515

Claims priority, application Japan, Sep. 5, 1983, 58-163585; Sep. 5, 1983, 58-163590; Sep. 5, 1983, 58-163595; Sep. 5, 1983, 58-163599; Oct. 3, 1983, 58-184691; Oct. 3, 1983, 58-184692

Int. Cl.[4] **A61B** *1/04, 1/06;* **H04N** *5/235, 11/06*

U.S. Cl. 358—98 **20 Claims**

1. Automatic dimmer for an endoscope characterized in that it has a long and narrow inserting member having an inserting end at one end and a viewing end at the opposite end, image forming lens system at the inserting end for forming the image of a subject, solid pickup element whose image pickup face is provided at the focal point of the said image forming lens system in said inserting end, a video prooessor at said viewing end of said inserting member for receiving signals corresponding to the picture elements output from said solid pickup element and for outputting said signals as color signals, display equipment for displaying a color picture with said color signals output from said video processor, illuminating means at said inserting end of said inserting member for illuminating within the image forming range of said lens system, said illuminating means including a light distributing lens at the inserting end of said inserting member, a light source for said illuminating means, a light distributing lens, means responsive to applied electric signals for regulating the quantity of light transmitted from said light source to said light distributing lens, dimmer



signal generating means responsive to said color signals from said video processor and for forming dimmer signals, and driving circuit means for outputting an electrical signal and for changing the quantity of light from said light source to said illuminating means in accordance with the level of the signal applied.

4,622,585

COMPRESSION/DECOMPRESSION SYSTEM FOR TRANSMITTING AND RECEIVING COMPRESSED PICTURE INFORMATION ARRANGED IN ROWS AND COLUMNS OF PIXELS

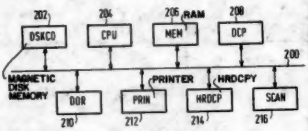
Jogchum Reitsma, Apeldoorn, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 11, 1984, Ser. No. 599,039

Claims priority, application Netherlands, Apr. 11, 1983, 8301264

Int. Cl.[4] **H04N** *7/12*

U.S. Cl. 358—135 **12 Claims**



1. In a system for line-wise compressing and decompressing a picture field which is made of a plurality of rows and columns of pixel data, a compression device comprising:

a first input for receiving said picture field pixel data;

a read/write memory organized on a word basis connected to store at least a line of said pixel data received from said first input;

a first shift register coupled to receive a row of said pixel data from said first input;

a second shift register connected to receive pixel data from said read/write memory which, during a memory cycle with said first register, receives the preceding row of pixel data having the same column position as said first register data;

a compression translator connected to said first and second shift registers, said compression translator generating from line pixels received from said first and second shift registers a series of compression bits, successive lines of pixel data generating successive groups of compression bits which have neither fill bits nor end of line bits; and,

a series to parallel converting buffer fed through a first input

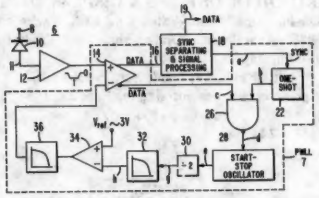
by said compression translator, and buffer having a dynamic second input and output for communicating with a parallel local communication bus.

4,622,586

DIGITAL SLICER HAVING A PULSE-WIDTH LOCKED LOOP

Mohamed M. A. Megeid, Canton, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 4, 1985, Ser. No. 719,803
Int. Cl.[4] H04N *5/10*; H03B *1/00*; H04B *9/00*
U.S. Cl. 358—153 **20 Claims**



15. A digital slicer for a bit stream, said bit stream including level indicating pulses, said slicer comprising:

comparator means including first and second input terminals, said first input terminal being coupled for receiving said bit stream and said second input terminal being coupled for receiving a reference slicing signal, for comparing said bit stream with said reference slicing signal for generating compared pulses including compared level indicating pulses;

gated oscillator means coupled to said comparator means for generating bursts of oscillations in response to said compared level indicating pulses;

bistable means coupled to said gated oscillator means for changing state in response to each of said oscillations in said bursts of oscillations, said bistable means producing an output signal having a first state before receipt of each of said bursts of oscillators and having a second state after receipt of one of said bursts of oscillations containing an odd number of oscillations and having said first state after receipt of one of said bursts of oscillations containing an even number of oscillations;

averaging and control signal processing means coupled to said bistable means for averaging said first and second states of said output signal of said bistable means and for processing the signal so averaged to generate said reference slicing level; and

coupling means coupled to said averaging and control signal processing means and to said comparator means for coupling said reference slicing level to said comparator means with a polarity selected to maintain constant duration of said compared level indicating pulses.

4,622,587

MONOLITHIC DELTA FRAME CIRCUIT

Dana Dudley, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 7, 1984, Ser. No. 638,606
Int. Cl.[4] H04N *5/213*
U.S. Cl. 358—167 **7 Claims**

1. A delta frame circuit comprising:

a. an X address circuit means;

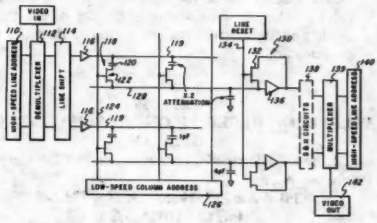
b. a demultiplexer operatively connected to the X address circuit means and to a single-line video input line for demultiplexing the single-line video line by line;

c. a line shift means operatively connected to the demultiplexer for shifting by line the demultiplexed video signals;

d. a plurality of buffer amplifiers operatively connected to the line shift register for lowering line parasitics;

e. a Y address circuit means;

f. a plurality of difference frame elements arranged in rows and columns operatively connected by rows and columns to the plurality of buffer amplifiers and Y address circuit means to address sequentially each difference frame element of the plurality of difference frame elements receiving a frame of signals plus noise and subtracting the noise or noise-signal from the signals plus noise;



g. a multiplexer;

h. a reset means operatively connected to the plurality of difference frame elements and multiplexer for suppressing amplifier fixed-pattern noise offsets; and

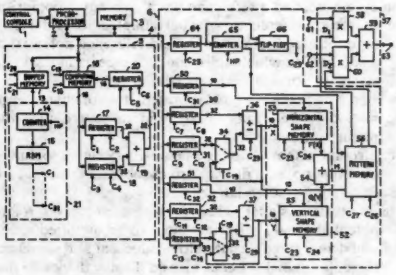
i. a line address register operatively connected to the multiplexer for controlling the output of the video signals through a video output terminal.

4,622,588

METHOD FOR GENERATING A VIDEO IMAGE COMPRISING A GEOMETRICAL FIGURE AND A SHAPE GENERATOR FOR CARRYING OUT SAID METHOD

Franck Chapuis, Rennes; Guy Urbain, Argenteuil, and Gilles Baubrand, Bois-Colombes, all of France, assignors to Thomson CSF, Paris, France

Filed May 7, 1984, Ser. No. 607,705
Claims priority, application France, May 11, 1983, 83 07903
Int. Cl.[4] H04N *5/262*
U.S. Cl. 358—183 **8 Claims**



1. A method for generating a video image comprising a geometrical figure which can be represented in a mobile cartesian coordinate system having (X, Y) coordinates by an equation of the form H(X, Y)=constant, composed of one-dimensional functions with a value of the constant defining the size of the figure, comprising the steps of:

storing at least one table of values for each of the one-dimensional functions which compose the equation of the figure;

determining cartesian coordinates X and Y corresponding to

each imaged point of an image to be generated, in said mobile coordinate system;

computing a value M=H(X, Y) for each point of the image as scanning of the image to be generated takes place, from values of the tables; and

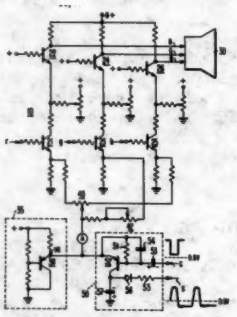
generating in respect of each of the image points a video signal which is a function oi the value M which has been computed for the image point in said computing step, this vlaue M representing the location of the image point, the location being inside the figure when M is less than the value of the constant defining the size of the figure and outside of the figure when M is greater than the value of the constant.

4,622,589

TELEVISION RECEIVER ON-SCREEN CHARACTER DISPLAY

Isaac M. Bell, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 15, 1985, Ser. No. 723,149
Int. Cl.[4] H04N *5/262*
U.S. Cl. 358—183 9 Claims



1. In a video signal processing and display system including a source of image representative video signals; an image display device for providing a picture display during image intervals in response to applied video signals; and a display driver stage with a signal input coupled to said video signal source, a signal output for providing amplified video signals to said display device, and a reference input; apparatus comprising:

a source of reference potential coupled to said reference input of said display driver, said reference potential being a potential to which video signals processed by said driver stage are normally referenced;

a source of auxiliary signal representative of character information to be displayed by said display device during picture intervals; and

control means for coupling said auxiliary signal to said reference input of said display driver separate from said source of reference potential; wherein

said auxiliary signal when present causes said reference potential at said reference input to be modified such that said driver stage is caused to produce, at said signal output thereof, a signal for causing said display device to display said character information.

8. In a video signal processing and display system including a source of image representative video signals; an image display device for providing a picture display during image intervals in response to applied video signals; and a display driver stage with a signal input coupled to said video signal source, a signal output for providing amplified video signals to said display device, and a reference input; apparatus comprising:

a source of auxiliary signal representative of character information to be displayed by said display device during picture intervals;

control means for coupling said auxiliary signal to said reference input of said display driver for causing said driver stage to produce, at said signal output thereof, a character information drive signal for said display device; and

biasing means coupled to said control means for establishing the bias thereof, said control means bias being determinative of the intensity of displayed character information procuded in response to said character drive signal; wherein

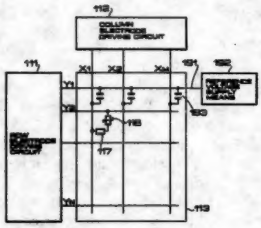
said biasing means derives said control means bias from a source of locally generated synchronizing signal.

4,622,590

METHOD OF DRIVING A DISPLAY DEVICE

Seigo Togashi, c/o Citizen Watch Co., Ltd., Technical Laboratory, 840 Azatakeno, Ooazashimotomi, Tokorozawa-shi, Saitama-ken, Japan

Filed Feb. 24, 1984, Ser. No. 583,307
Claims priority, application Japan, Feb. 28, 1983, 58-032169
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—241 4 Claims



1. A method of driving a display device which includes row electrodes, column electrodes, and a active elements and display members provided at crossing points of said row and column electrodes and having a storing function, comprising the steps of: storing at first a serial video signal into individual ones of said column electrodes, and then at a next timing, rendering operative a group of said active elements corresponding to particular ones of said row electrodes, causing signals to be stored into corresponding ones of said display members, further wherein the serial video signal is a signal which has a horizontal retrace period, and rendering operative the group of said active elements during at least part of the horizontal retrace period.

4,622,591

APPARATUS AND METHOD FOR PRECISELY ORIENTING ORIGINALS ON AN IMAGE SCANNER DRUM

Mikizo Katsuyama; Teruo Fujii, and Hirohisa Tanaka, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

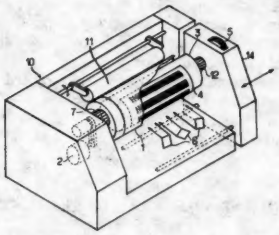
Filed Nov. 25, 1985, Ser. No. 801,695
Claims priority, application Japan, Dec. 6, 1984, 59-258742
Int. Cl.[4] H04N *1/00*
U.S. Cl. 358—256 10 Claims

1. Apparatus for precisely locating an image-bearing original for selectively oriented affixation to the exterior surface of a hollow, cylindrical, transparent walled drum, controllably rotatable about a predetermined axis of rotation of a drum-type image scanning system, comprising:

a predetermined pattern on a thin transparent sheet of a size and shape not larger than the inside surface of said hollow cylindrical drum; and

pattern supporting means for supporting said pattern within said hollow cylindrical drum, such that said pattern is

supported adjacent said inside surface of said drum in a predetermined juxtaposition with said axis of rotation and



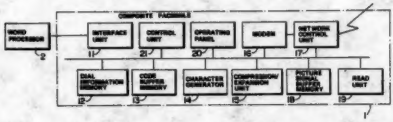
rotatable with said drum for viewing of said pattern through said transparent wall of said drum.

4,622,592

COMPOSITE FACSIMILE APPARATUS

Norimitsu Ikehata, Hino; Kiyoshi Kobayashi, Tokyo, and Hisashi Maeda, Hino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Apr. 27, 1984, Ser. No. 604,515
Claims priority, application Japan, Apr. 29, 1983, 58-76474
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—257 **7 Claims**



1. In a composite facsimile apparatus connected to a data terminal unit processing so as to transmit and receive either one of a character code and a picture signal through a transmission line, the improvement comprising:

means for detecting from a plurality of character codes representing a message sent from said data terminal unit, a predetermined designation character code that designates a dial information character code representing dial information;

dial information output means, responding to said detecting means, for forming said dial information character code from said predetermined designation character code and for forming and outputting corresponding dial information based on said dial information character code;

dial signal output means for outputting a dial signal in response to said dial information; and

transmission control means for transmitting either one of the character code and picture code from said data terminal unit to a remote facsimile apparatus corresponding to said dial signal.

4,622,593

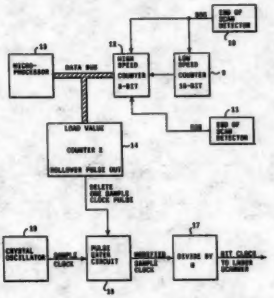
POLYGON SIGNATURE CORRECTION

Douglas N. Curry, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1984, Ser. No. 614,928
Int. Cl.[4] H04N *1/40, 1/17*
U.S. Cl. 358—284 **6 Claims**

1. In a raster output scanning system of the type having a motor driving a rotating polygon, means for measuring the scan speed of each facet, and means responsive to each facet scan speed measurement for varying the bit clock during succeeding scans to compensate for each facet speed variation to produce lines of data of equal length independent of individual facet scan speed, or in a raster input scanning system of the type having a motor driving a rotation polygon, means for measuring the scan speed of each facet, and means responsive to each facet scan speed measurement for varying the bit clock during succeeding scans to compensate for the speed variation to acquire proper numbers of data bits independent of individual scan speed, the improvement comprising:

a sample clock generator,



means for calculating from the measurement for the current facet the number of sample clocks which must be removed from the stream of sample clocks, which determine the rate at which data is fed to the raster output or input scanner, to match the data rate to the current facet scan speed,

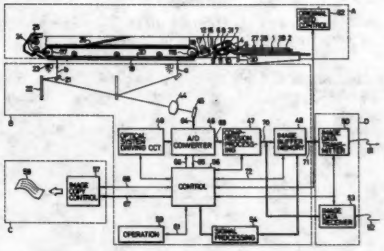
means for deleting an evenly spaced number of sample clocks, equal to the calculated number, from the stream of sample clocks to create a corrected bit clock.

4,622,594

IMAGE RECORDING APPARATUS

Takeshi Honjo, Kawasaki; Makoto Kitahara; Yasumichi Suzuki, both of Tokyo, and Naomi Takahata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,783
Claims priority, application Japan, Oct. 26, 1983, 58-200368
Int. Cl.[4] H04N *1/10*
U.S. Cl. 358—293 **7 Claims**



1. An image recording apparatus comprising:

reading means operated in a first mode for reading image data while an original is being moved and a second mode for reading the image data while the original is stopped at a predetermined position;

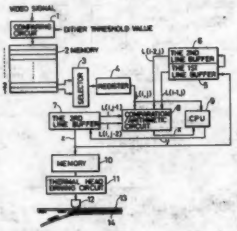
recording means for recording an image on a recording medium in accordance with the image data read by said reading means; and

selecting means for selecting one of the first and second modes in accordance with preset recording sheet number data.

4,622,595
IMAGE DISPLAY UNIT CAPABLE OF TONE REPRODUCTION

Masayuki Hisatake; Haruhiko Moriguchi; Toshiharu Inui, and Akio Noguchi, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 678,877
Claims priority, application Japan, Dec. 21, 1983, 58-241635
Int. Cl.[4] H04N *1/40, 1/21, 1/23*
U.S. Cl. 358—296 **11 Claims**



1. An apparatus for producing a half tone reproduction of an image in the form of a plurality of picture element patterns, each picture element pattern being composed of an n×m matrix of dots and each picture element pattern having a half tone level determined by a combination of densities of the n×m dots in that picture element pattern; the apparatus comprising:

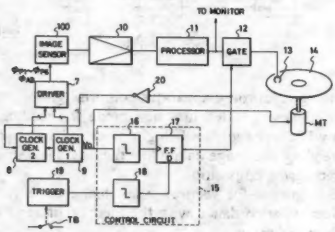
means for comparing a specific picture element pattern with at least one adjacent picture element pattern to determine whether an identity exists; and

means for changing an arrangement of the dots which form the specific picture element pattern to yield a different dot disposition with an equivalent half tone level, prior to producing the half tone reproduction of the image, in a case when at least a predetermined number of adjacent picture element patterns are identical to the specific picture element pattern, to eliminate undesirable patterns which detract from visual quality of the half tone reproduction and which are caused by presence of identical picture element patterns adjacent one another.

4,622,596
IMAGE PICKUP APPARATUS

Akira Suga, and Tadashi Okino, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,954
Claims priority, application Japan, Feb. 21, 1983, 58-27291; Feb. 21, 1983, 58-27292; Feb. 21, 1983, 58-27293; Feb. 21, 1983, 58-27294
Int. Cl.[4] H04N *5/76, 3/14*
U.S. Cl. 358—335 **46 Claims**



1. An image recording system comprising:

(a) a photosensing part for converting an optical image into an electrical signal;

(b) combining means for combining a part of the electrical signal converted by said photosensing part with a signal opposite in polarity to said electrical signal, said combining means having at least two operation modes;

(c) recording means for recording a signal representing a still picture in response to said electrical signal converted by said photosensing part;

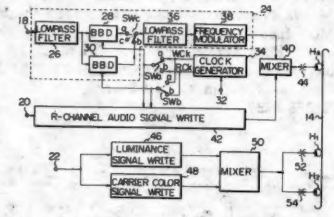
(d) trigger means for allowing said recording means to selectively record a signal representing a still picture; and

(e) control means for controlling said combining means in response to an output of said trigger means.

4,622,597
SOUND AND VIDEO MULTIPLEX RECORDING SYSTEM

Akira Hirota, Chigasaki, and Seiji Higurashi, Chiba, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Nov. 28, 1983, Ser. No. 555,869
Claims priority, application Japan, Nov. 30, 1982, 57-210212
Int. Cl.[4] H04N *5/782*
U.S. Cl. 358—343 **6 Claims**



1. A multiplex recording system for a video tape recorder comprising:

a rotary member adapted to be wrapped around with a moving magnetic recording medium over a predetermined angular range;

at least two video signal recording rotary heads mounted on said rotary member at a predetermined spacing from each other, said rotary heads having azimuth angles which are different from each other and recording a video signal on the magnetic recording medium by scanning thereof as said rotary member rotates in a predetermined scanning direction;

a single audio signal recording rotary head mounted on the rotary member in a position ahead of one of the two video signal recording rotary heads by a predetermined angle with respect to said predetermined scanning direction, said audio signal recording rotary head having an azimuth angle which differs from the azimuth angles of the video signal recording rotary head; and

means for supplying to said audio signal recording rotary head at every one track scan period a plurality of channels of frequency-modulated audio signals which have different carrier frequencies from each other and respectively modulated by a plurality of channels of audio signals, which are time-compressed more than 2N times (where N is a number of fields of video signal to be recorded in one track), and controlling the audio signal recording rotary head and the video signal recording rotary heads such that the audio signal recording rotary head records in the moving recording medium an audio track recorded with the plurality of channels of frequency-modulated audio signals at a two-track pitch, while the other video signal recording rotary head forms in the recording medium a video track recorded with a video signal at one-track pitch, said video track being superposed on the previously recorded audio track.

4,622,598

METHOD OF RECORDING ODD AND EVEN WORDS OF ONE CHANNEL PCM SIGNALS IN PLURAL TRACKS

Toshitada Doi, Kanagawa, Japan; Claudia Brandes, Ruemlang, and Roger Lagadec, Zurich, both of Switzerland, assignors to Sony Corporation, Tokyo, Japan and Willi Studer AG, Regensdorf, Switzerland

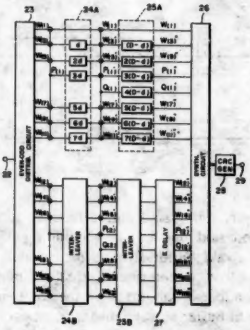
PCT No. PCT/JP83/00430, § 371 Date Jul. 27, 1984, § 102(e) Date Jul. 27, 1984, PCT Pub. No. WO84/02417, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 6, 1983, Ser. No. 637,229

Claims priority, application Japan, Dec. 6, 1982, 57-213613

Int. Cl.[4] G11B *5/02, 5/09;* G06F *11/10*

U.S. Cl. 360—22 6 Claims



1. A method for PCM signal recording wherein each channel of a multiple channel input PCM signal formed of a plurality of words is subjected to distribution to a plurality of recording tracks, characterized by the steps of selecting the number of tracks in which each said channel is to be divided, determining a distribution matrix pattern for said input signal words over said selected number of tracks, distributing said words in said channels to said recording tracks switching distributing means in accordance with said determined distribution matrix pattern, and in that the PCM signals composed of the distributed words and corresponding to the respective tracks are supplied to a plurality of recording heads via a corresponding plurality of separate encoders adapted to correct for coding error so that recording is made in such a manner that a plurality of recording tracks, determined in number as the product of the selected number of tracks and the number of channels, are formed on a recording medium.

4,622,599

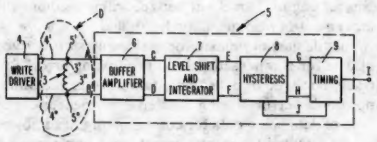
WRITE DATA TRANSITION DETECTOR

David E. Norton, Jr., Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 19, 1984, Ser. No. 672,705

Int. Cl.[4] G11B *27/36, 5/09*

U.S. Cl. 360—31 10 Claims



1. An apparatus comprising:

an electromagnetic thin film data write head;

a write current generator connected across the head for circuiting write currents through the head and alternately varying in direction across the head to induce changes in the magnetic state of a magnetic data storage medium juxtaposed to the head, there being a maximum time period between sequential reversals of the write current direction across the head for the data encoding scheme employed by the apparatus; and

a write fault detection circuit comprising:

hysteresis circuit means responsive to a pair of voltage levels related in magnitude to voltage levels at either side of the write head for indicating the state of a voltage difference across the write head, the hysteresis circuit means stabilizing in one of two possible states when the pair of voltage levels across the head are of the same polarity and of a sufficiently large difference in magnitude and the hysteresis circuit means reversing state only when the relative magnitudes of the pair of voltage levels have reversed to said sufficiently large difference; and

timing means responsive to the state of the hysteresis circuit means for generating a fault indication when the hysteresis circuit means has remained in one state for a period of time greater than said maximum time.

4,622,600

ROTARY-HEAD TYPE PCM DATA RECORDING/REPRODUCING METHOD AND APPARATUS WITH A REDUNDANCY-REDUCED CONTROL DATA FORMAT

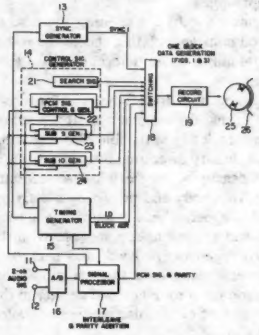
Hiroo Okamoto; Masaharu Kobayashi; Takaharu Noguchi, and Takao Arai, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,551

Claims priority, application Japan, Dec. 26, 1983, 58-243858; Dec. 26, 1983, 58-243859; Jan. 11, 1984, 59-1923

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—32 9 Claims



1. A method of recording data on a magnetic tape using a rotary-head PCM signal recorder by forming m PCM signals to which are appended a synchronizing signal, control signals of substantially greater than k bits representing control data related to said PCM signals, and a parity signal for error detection and correction to form one block of a record, with signals of n blocks being recorded on one track of said magnetic tape, comprising the steps of:

(a): distributing the bits of control data in the control signals which are common to at least one track of n blocks by distributing said data in the blocks of each of a number of groups of n_1 blocks in said track by allocating k bits of said control data to each of the blocks of each group, the number of groups n_2 satisfying the relationship $n=n_1\times n_2$, and

(b): recording said distributed control data n_2 times on one track, where m, n, n_1 and n_2 are positive integers more than 1, and k is a positive integer.

4,622,601

FLEXIBLE DISC DEVICE FOR MEDIA OF DIFFERENT TRACK DENSITIES

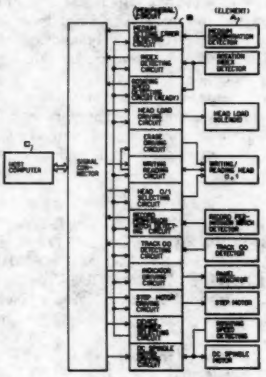
Shin Isozaki; Masaru Sasaki, and Shuroku Hosaka, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,439

Claims priority, application Japan, Oct. 1, 1982, 57-173066; Oct. 1, 1982, 57-173067

Int. Cl.[4] G11B *5/09, 5/127, 21/08*

U.S. Cl. 360—48 **11 Claims**



1. A flexible disc device having a writing/reading magnetic head for reading and writing a flexible disc medium, said device comprising:

(a) a spindle motor for rotating the disc medium at a prescribed constant rotating speed, the rotating speed of said spindle motor being determined by a spindle motor drive circuit;

(b) magnetic head transfer means for moving the magnetic head so that the magnetic head is positioned with respect to any track of the flexible disc medium;

(c) track density discrimination means for discriminating the track density of the flexible disc medium installed within the device body and providing a discrimination signal;

(d) said magnetic head comprising a record regenerative head and erasing head cores placed at both sides of said record regenerative head, and being enabled to change effective erasing head track width at the recording state corresponding to the record density in the diameter direction of the flexible disc medium installed within the device; and

(e) means for changing the effective erasing head track width, said changing means being driven corresponding to the discrimination signal from the track density discrimination means, thereby data compatibility in both directions of reading and writing by the magnetic head being given regarding at least two flexible disc media different in the track density.

4,622,602

SYSTEM FOR RECORDING AND/OR REPRODUCING DIGITAL DATA

Ken Kutaragi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,187

Claims priority, application Japan, May 31, 1984, 59-111709

Int. Cl.[4] G11B *5/09*

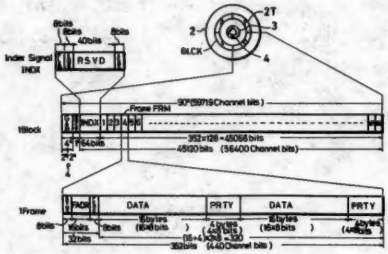
U.S. Cl. 360—48 **10 Claims**

1. Apparatus for recording and/or reproducing digital data relative to a rotary magnetic disk, in which said digital data is formed as blocks of interleaved data, comprising:

magnetic head means cooperating with said magnetic disk for a transfer of data therebetween;

circuit means for controlling reading and/or writing of digital data between said magnetic disk and said magnetic head means;

buffer storage means connected to said circuit means for storing at least one block of said digital data and;



means for re-arranging said digital data to be written in and read out from said magnetic disk including means for storing said data in said buffer storage means at consecutive addresses in a first predetermined area of said buffer storage means and address converter means for reading said data stored in said buffer storage means in an order corresponding to a record pattern on said magnetic disk, prior to writing said digital data on said rotary magnetic disk by said magnetic head means.

4,622,603

HEAD POSITIONING SYSTEM FOR MAGNETIC RECORDING/PLAYBACK APPARATUS

Sinji Mizunuma; Masayoshi Sunada, both of Hitachi, and Shigemitsu Higuchi, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,299

Claims priority, application Japan, Oct. 7, 1983, 58-186986; Oct. 7, 1983, 58-186987; Oct. 18, 1983, 58-193553; Mar. 16, 1984, 59-49104

Int. Cl.[4] G11B *5/55*

U.S. Cl. 360—78 **4 Claims**

1. A head positioning system for a magnetic recording/reproducing apparatus for recording/reproducing information on/from a recording medium by at least one magnetic head, said system employing a stepping motor for positioning of said magnetic head, said system comprising:

means for changing over driving voltages applied to said stepping motor during a step movement thereof and after said step movement thereof, respectively;

means for counting tracks of said recording medium with the movement of said magnetic head; and

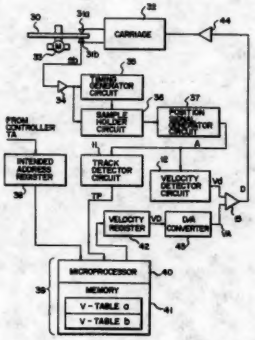
non-volatile memory means for previously storing two types of data for compensating head positioning errors for each track, one type of data being data for compensating head positioning errors during the step movement and the other type of data being data for compensating head positioning errors after said step movement, said two types of data being read out in accordance with the content of said counting means for each step movement and after said step movement to thereby control said stepping motor in accordance with the read out data so as to accurately position said magnetic head for each track.

4,622,604

MAGNETIC HEAD CONTROLLING APPARATUS

Yasuichi Hashimoto, and Tomihisa Ogawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 18, 1984, Ser. No. 611,758
Claims priority, application Japan, May 23, 1983, 58-90285
Int. Cl.[4] G11B 5/55
U.S. Cl. 360—78 1 Claim



1. A magnetic head controlling apparatus comprising:

a position signal generator means for generating a position signal on the basis of servo-data previously recorded on a magnetic disk, said position signal representing the position of the magnetic head on the magnetic disk;

a track detector means for generating a track pulse every time the magnetic head crosses a data track on the magnetic disk, on the basis of the position signal applied for the position signal generator means;

an intended address memory means for storing an intended track address on the magnetic disk which represents the intended moving position of the magnetic head;

an intended velocity memory means for storing first and second tables beforehand, said first table containing intended velocity data suitable for use when the moving distance of said magnetic head is comparatively short, said second table containing intended velocity data suitable for use when that moving distance is comparatively long;

an intended velocity data determining means for counting the number of track pulses generated from said track detector means, for calculating a moving distance by which said magnetic head must be moved to the intended track address, based on the difference between the intended track address and the number of track pulses counted, and for accessing said intended velocity memory means with an address corresponding to the moving distance calculated, thereby selecting intended velocity data most apporpriate for said magnetic head from one of said first and second tables; and

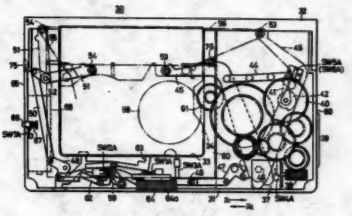
a magnetic head moving menas for moving the magnetic head at an appropriate velocity on the basis of the intended velocity data determined by the intended velocity data determining means.

4,622,605

TAPE CASSETTE ADAPTER HAVING A MOTOR FOR DRIVING TAPE DRAW-OUT MEANS THEREOF TO FORM A PREDETERMINED TAPE PATH THEREIN

Mitsuharu Tsuruoka, Kodaira, and Keiji Sasaki, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Jun. 5, 1984, Ser. No. 617,346
Claims priority, application Japan, Jun. 16, 1983, 58-93062[U]
Int. Cl.[4] G11B 5/008, 15/00, 17/00; G03B 1/04
U.S. Cl. 360—94 3 Claims



1. An adapter for a miniature type tape cassette, said miniature type tape cassette having a size smaller than a standard type tape cassette which is used with a standard type recording and/or reproducing apparatus which is primarily designed to play the standard type tape cassette, said miniature type tape cassette being playable by itself on a recording and/or reproducing apparatus of a type different from the stand type recording and/or reproducing apparatus, said standard type recording and/or reproducing apparatus having a first electrical circuit comprising a power source circuit for operating said adapter and a contact disposed at a position exposed in a space into which said adapter is inserted, said contact being an output terminal of said electrical circuit, said adapter comprising:

an adapter case having an external form and size substantially the same as the external form and size of said standard type tape cassette;

an accommodating part for accommodating said miniature type tape cassette;

a tape draw-out mechanism provided within said adapter case for drawing a tape out of said miniature type tape cassette which is accommodated within said accommodating part, and for forming a tape path within said adapter case;

a second electrical circuit located within said adapter case, said second electrical circuit comprising a motor driving circuit including a motor and a battery for driving said motor;

a gear mechanism provided within said adapter case and driven by said motor for operating said tape draw-out mechanism;

terminal means coupled to said second electrical circuit and exposed at a surface of said adapter case, said terminal means making contact with said contact of said standard type recording and/or reproducing apparatus when said adapter is inserted into said standard type recording and/or reproducing apparatus to electrically couple said second electrical circuit to said first electrical circuit so that said motor driving circuit is electrically coupled to said power source circuit through said contact and said terminal means; and

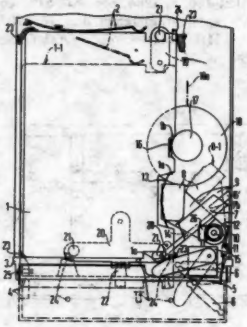
an electrically disconnecting mechanism provided within said adapter case for electrically disconnecting said battery from said motor driving circuit automatically when said adapter is inserted into said standard type recording and/or reproducing apparatus.

4,622,606

MAGNETIC TAPE RECORDER

Guttorm Rudi, Fjellhamar, Norway, assignor to Tandberg Data A/S, Oslo, Norway

Filed Nov. 25, 1983, Ser. No. 555,151
Int. Cl.[4] G11B *5/008, 15/00*
U.S. Cl. 360—96.5 **20 Claims**



1. A magnetic tape transducer system, comprising: a tape transducer unit; a cassette having a front end and first and second lateral ends,

a magnetic tape movable along a tape path past a scanning location at the front end of the cassette, and a dust cover which is pivotable between a closed position covering said scanning location and an open position exposing said scanning location; the tape transducer unit having a magnetic head for scanning of said magnetic tape at said scanning location, a tape drive motor, and a capstan driven by said tape drive motor positioned to drive the magnetic tape along the tape path; the tape transducer unit having an insertion channel means for receiving said cassette with the first lateral end leading and wherein the first lateral end is adjacent a back end of the channel means when the cassette is fully inserted; the magnetic head and the capstan being disposed at a side of said insertion channel means adjacent the cassette front end when the cassette is fully inserted, insertion means for inserting the cassette into a final position in the channel means; means for pivoting said dust cover to its open position as the cassette is being inserted by the insertion means, a magnetic head carrier means carrying the magnetic head and pivotably mounted to the transducer unit; and means coupling the head carrier means to the insertion means for swinging the magnetic head from an idle position into scanning relation with the magnetic tape at the scanning location behind the dust cover simultaneously as the dust cover is pivoted from its closed to open positions during insertion of the cassette by the insertion means.

15. A magnetic tape transducer system for use with a cassette containing a tape and having a drive opening and a tape scanning location protected by a pivotable dust cover at a front end, and first and second lateral ends substantially perpendicular to the front end, comprising:

an insertion channel means for receiving the cassette first lateral end first, the insertion channel means having a back end adjacent the inserted first lateral end when the cassette is fully inserted and a front side parallel to an insertion direction of the cassette; a drive means positioned at said front side of the insertion channel means for interaction with the cassette drive opening and a magnetic head assembly also positioned at said front side positioned to interact with the scanning location;

a manually activatable insertion means for inserting the cassette into the channel means;

means coupled to said insertion means for pivoting the pivotable cassette dust cover from a closed position to an open position as the cassette is inserted into the insertion channel means; and

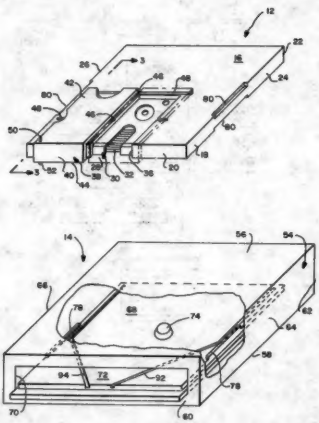
means coupled to the insertion means for simultaneously moving the magnetic head assembly as the dust cover is pivoted such that the magnetic head assembly is positioned directly at the scanning location.

4,622,607

INFORMATION STORAGE AND RETRIEVAL SYSTEM INCLUDING AN INFORMATION CONTAINING CARTRIDGE HAVING A SLIDABLE COVER

Kobert R. Smith, II, 23230 Ravensbury Ave., Los Altos Hills, Calif. 94022

Filed Jan. 4, 1983, Ser. No. 455,474
Int. Cl.[4] G11B *5/012, 23/03*
U.S. Cl. 360—97 **5 Claims**



1. In an information storage and retrieval system including a cartridge containing means in the form of a magnetic disc for storing information within a closed housing, the housing including a cover slidably movable between an opened position and closed position, and an apparatus for retrieving information from said storing means when the cartridge and apparatus are combined in a predetermined way with said cover in its opened position, the improvement comprising:

(a) means including a guide pin and track forming part of said cover and said apparatus respectively for automatically causing said cover to slide open from its closed position in order to gain access to said information storing means by said apparatus when said cartridge and apparatus are combined and for automatically causing said cover to slide closed when the cartridge is separated from said apparatus.

4,622,608

CARRIAGE TRAVELING MECHANISM FOR FLOPPY DISC DRIVE

Hiroshi Mabuchi, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

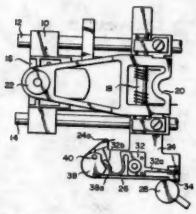
Filed Jun. 22, 1984, Ser. No. 623,726
Claims priority, application Japan, Jun. 24, 1983, 58-114482; Oct. 21, 1983, 58-162988[U]
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—106 **4 Claims**

1. A carriage traveling mechanism for a floppy disc drive comprising:

an α belt, two ends of which are fixed at the carriage and a part of which is wound around a drive shaft;

a tension cam supported by the carriage in close contact with said α belt in the vicinity of one of its fixed end; and

a tension spring fixed to the carriage urging said tension cam toward said α belt,



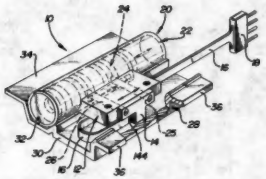
whereby the required tension force is regularly provided to said belt.

4,622,609

READ/WRITE HEAD POSITIONING APPARATUS

Richard E. Barton, 187 Kent St., Scituate, Mass. 02066

Filed May 4, 1984, Ser. No. 607,192
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—106 **19 Claims**



1. Apparatus for controlling the position of a read/write head with respect to an information storage disk comprising:

a carrier adapted for connection to said head;

drive means for said carrier including:

a generally tubular stator having a circumferential wall and an interior wall surface and said stator circumferential wall having an axial slot through a central portion thereof;

a generally cylindrical armature disposed within said stator and having a circumferential surface;

means associated with said armature for selectively inducing a magnetic field at different axial positions along said armature;

portions of said circumferential surface of said armature adapted to concentrate said magnetic field;

portions of said interior wall surface of said stator adapted to concentrate said magnetic field;

said field concentrating surface portions cooperating to position said armature with respect to said stator at selected axial positions;

guidance means for said armature disposed completely within said drive means to control pitch, yaw, heave and sway of said armature while permitting free axial motion of said armature within said stator;

said guidance means including at least two sliding bearings spaced axially apart on said armature and each haing a circumferential bearing surface sliding directly on a portion of said interior wall surface of said stator; and,

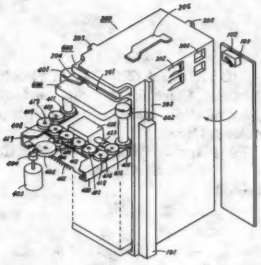
connecting means connected to said armature and said carrier and extending through said stator slot to couple said armature and said carrier together.

4,622,610

AUTOMATIC CASSETTE EXCHANGING PLAYBACK DEVICE

Yasuyuki Makigawa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP83/00002, § 371 Date Aug. 9, 1983, § 102(e) Date Aug. 9, 1983
PCT Filed Jan. 7, 1983, Ser. No. 525,032
Claims priority, application Japan, Jan. 8, 1982, 57-2096; Jan. 8, 1982, 57-2097; Jan. 8, 1982, 57-2098; Jan. 8, 1982, 57-2099; Jan. 8, 1982, 57-1434[U]
Int. Cl.[4] G11B *15/68, 5/54, 21/22*
U.S. Cl. 360—92 **14 Claims**



1. An automatic cassette exchanging playback device for selecting any one of a plurality of magnetic cassette tapes for reproduction of records thereon, comprising:

cassette reproduction means for reproduction of the records on said magnetic cassette tapes;

an elevator assembly for elevating and lowering said cassette reproduction means in a vertical direction;

a cassette cabinet disposed adjacent said elevator assembly for receiving the plurality of the magnetic cassette tapes therein in a vertical direction;

a cassette feeder assembly for picking up one of said magnetic cassette tapes out of said cassette cabinet inserting the same into said cassette reproduction means;

selection command means for providing a command for selection of any one of the magnetic cassette tapes in said cassette cabinet; and

control means for controlling said elevator assembly in response to the command from said selection command means to elevate or lower said cassette reproduction means and stop said elevator assembly at a position corresponding to the selected one of the magnetic cassette tapes in said cassette cabinet, said control means further controlling said cassette feeder assembly to pick up the selected one of the magnetic cassette tapes out of said cassette cabinet and insert the same into said cassette reproduction means and further comprising

a pair of roller levers each rotatable about a pivot and having one end extending adjacent both sides of the magnetic cassette tape, repsectively, in said cassette cabinet;

rollers installed on said one end of said pair of the roller levers and held in contact with the both sides of said magnetic cassette tape;

a spring member for pulling the remaining end of each of said pair of the roller levers so as to move them closely to each other;

means for attracting said remaining end of each of said pair of the roller levers against the spring force of said spring member upon energization thereof, thus bringing said rollers into contact with sides of said magnetic cassette tape;

rotation force transmission means for transmission of rotation force into said respective rollers; and

a motor for rotating said rollers in different directions via said rotating force transmission means;

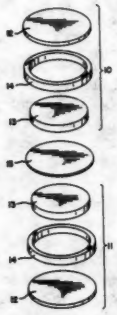
wherein said cassette feeder assembly picks up said magnetic cassette tape out of said cassette cabinet when said attracting means is energized to place said respective rollers into contact with the sides of said magnetic cassette tape and the rotation direction of said motor is controlled to rotate said rollers in a certain direction, and said cassette feeder assembly inserts said magnetic cassette tape into said cassette cabinet when said rollers are rotated in a different direction.

4,622,611

DOUBLE LAYER CAPACITORS

Phillip D. Bennett, Cleveland Heights, and John C. Currie, Novelty, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 2, 1985, Ser. No. 719,100
Int. Cl.[4] H01G *9/00*
U.S. Cl. 361—433 8 Claims



1. A double layer capacitor comprising a first and second electrode, said electrodes comprising a high surface area carbon constituent and an electrolyte, and an ionically conductive separator means between and in contact with said electrodes electronically separating said electrodes from each other, said electrolyte having a pH above about 2 whereby the capacitor exhibits low leakage current.

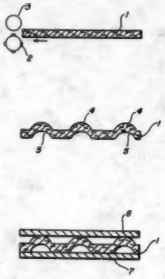
4,622,612

ELECTROLYTIC CAPACITOR

Tatsuji Tanouchi; Junichi Ushimoto; Satoru Okabayashi, and Toshio Ikegawa, all of Kochi, Japan, assignors to Nippon Kodoshi Corporation, Kochi, Japan

Filed Jul. 10, 1985, Ser. No. 753,459
Claims priority, application Japan, Jul. 19, 1984, 59-150578
Int. Cl.[4] H01G *9/00*
U.S. Cl. 361—433 7 Claims

1. An electrolytic capacitor comprising an anode foil, a cathode foil, and an electrolytic paper interposed between the anode foil and the cathode foil, which electrolytic paper is formed with a plurality of discontinuous projecting sections on its one side and recessed sections corresponding to the projecting sections in its other side by a secondary working step after a paper producing step, whereby said electrolytic paper is



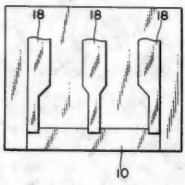
thicker and has low density in comparison with its initial state after the paper producing step.

4,622,613

THIN FILM MAGNETIC HEAD

Noboru Nomura, Kyoto; Kenji Kanai, Kumamoto, and Nobuyuki Kaminaka, Osaka, all of Japan, assignors to Matsushita Electric Industrials Co., Ltd., Osaka, Japan

Filed Oct. 7, 1983, Ser. No. 540,154
Int. Cl.[4] G11B *5/12, 5/30*
U.S. Cl. 360—113 8 Claims



1. A thin film magnetic head comprising a magnetoresistive effect element having a front tape contact edge, and at least two electrodes provided for said magnetoresistance effect element, said at least two electrodes being electrically and physically connected to said magnetoresistive effect element at a contact portion of said magnetoresistance element which is spaced rearwardly of said front contact edge of said magnetoresistive effect element such that said at least two electrodes do not extend to said front contact edge and as a consequence thereof deterioration of the electrodes is minimized.

4,622,614

MAGNETIC ERASING HEAD

Keitaro Yamashita, Zama, and Keizo Tsuneki, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,202
Claims priority, application Japan, Dec. 29, 1982, 57-233193
Int. Cl.[4] G11B *5/27*
U.S. Cl. 360—118 8 Claims

1. A semi-double gap magnetic erasing head comprising:

magnetic head core means having first and second end portions which oppose each other in spaced apart relationship;

magnetic center core means formed as a separate element of diverse material from said head core means and having at least a portion thereof situated between said first and second end portions and being out of contact therewith;

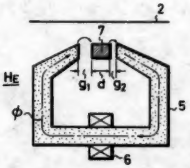
a first effective magnetic gap formed between said portion of

said magnetic center core means and said first end portion of said magnetic head core means;

a second effective magnetic gap formed between said portion of said magnetic center core means and said second end portion of said magnetic head core means;

said portion of said magnetic center core means situated between said first and second end portions having a predetermined width relative to said gaps, the width of said first effective gap being selected to be wider than the width of said second effective gap;

winding means associated with said magnetic head core means for inducing a magnetic flux in said first and second effective magnetic gaps; and



means for generating an erasing signal which is supplied to said winding means, said erasing signal having a frequency determined so that a relationship between the wavelength of said frequency of said erasing signal and said width of said magnetic center core means situated between said first and second end portions is selected so as to satisfy the following equation:

$$d \simeq (n+\tfrac{1}{2})\lambda$$

wherein

n: an integer

d: width of the magnetic center core

λ: wavelength of the erasing signal.

4,622,615

MAGNETIC TRANSDUCER FOR HIGH DENSITY RECORDING OR WRITING

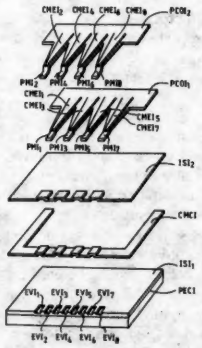
Jacques Desserre, Rambouillet, France, assignor to Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Jun. 29, 1984, Ser. No. 626,032

Claims priority, application France, Jul. 13, 1983, 83 11728

Int. Cl.[4] G11B *5/28*

U.S. Cl. 360—121 **9 Claims**



1. An integrated multi-head transducer for reading and writing data on tracks of a multi-track magnetic carrier moving past the multi-head transducer comprising a plurality of transducers, one for each track, each transducer comprising a first pole piece which is shared in common with all transducers of said plurality and a second pole piece, the first and second pole pieces being disposed adjacent to one side of the magnetic carrier with an air gap between extremities of the pole pieces and the magnetic carrier, the second pole piece being realized as a thin magnetically anisotropic layer having directions of difficult magnetization and easy magnetization respectively oriented normal and parallel to the magnetic carrier; first control means for generating a magnetic field parallel to the direction of difficult magnetization of the second pole pieces; and second control means disposed on each second pole piece for generating another magnetic field parallel to the direction of easy magnetization of the second pole piece; and wherein the second pole pieces of the plurality of transducers comprise first and second distinct sets of second pole pieces, a majority portion of the first and second sets being located in corresponding first and second spaced parallel planes, and the extremities of the second pole pieces of the first and second sets being formed such that the extremities of all second pole pieces are colinear, coplanar and spaced equidistant from one another with a spacing corresponding to the spacing between tracks on the magnetic carrier.

4,622,616

THIN FILM MAGNETIC HEAD FOR EQUALIZING OUTPUTS OF A TWO-CHANNEL TRACKING DEVICE

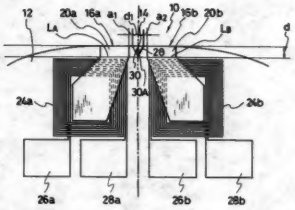
Masanori Isshiki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 21, 1984, Ser. No. 673,799

Claims priority, application Japan, Nov. 25, 1983, 58-221840

Int. Cl.[4] G11B *5/28, 5/22, 5/42*

U.S. Cl. 360—122 **7 Claims**



1. A thin film magnetic head for recording information on a recording medium with at least two channel tracks, comprising:

a head-forming base;

at least one pair of head sections formed on said head-forming base;

a depth detection mark formed at the middle of the separation between said head sections for detecting the lengths of the gap depth of said head sections, said depth detection mark being arranged so as to form an isosceles triangle whose base extends along said head-forming base on the side facing to said recording medium, and whose vertex is located, facing the base of the isosceles triangle, on the depth end line of the gaps of the head sections on the side which is not facing said magnetic recording medium as well as on the center line between said head sections; and

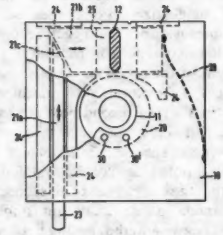
a holding plate arranged opposite to said head-forming base to hold said head sections and depth detection mark therebetween.

4,622,617

CLEANING APPARATUS FOR A DISC DRIVE

Joseph F. Fritsch, Dunmore, Ireland, assignor to Ryan Plastics Ireland Limited, Waterford, Ireland

Filed Nov. 15, 1984, Ser. No. 671,742
Claims priority, application Ireland, Nov. 18, 1983, 2705/83
Int. Cl.[4] G11B 5/91, 23/02
U.S. Cl. 360—128 7 Claims



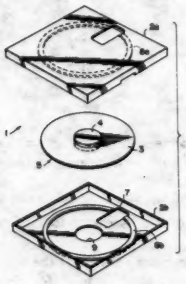
1. Apparatus for cleaning the read/write head of a drive unit for a jacketted flexible magnetic disc, comprising a thin substantially square jacket having in register on each side a central aperture and a slot which extends radially from adjacent the central aperture in a direction towards and normal to the rear edge of the jacket, the jacket containing a double-sided cleaning element having a pair of opposite cleaning surfaces of which a portion of each is exposed by a respective slot, the cleaning surfaces comprising respective layers of cleaning material secured together via an intermediate layer of a material which is impermeable to magnetic head cleaning fluid.

4,622,618

MAGNETIC RECORDING DISK CARTRIDGE

Kengo Oishi, and Tuyoshi Ono, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 5, 1983, Ser. No. 539,187
Claims priority, application Japan, Oct. 6, 1982, 57-151763[U]
Int. Cl.[4] G11B 23/03, 5/10, 5/127, 5/41
U.S. Cl. 360—133 1 Claim



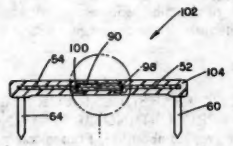
1. A magnetic recording disk cartridge comprising a recording disk having a hub at its center, a recording surface thereon, and terminating at an outer margin, and a flat casing for accommodating therein the recording disk, the casing having a pair of opposed major wall portions having inner surfaces extending substantially in parallel to the recording surface of the recording disk, the recording disk being adapted to be rotated at a high speed in the casing during recording and reproduction, wherein the improvement comprises a pair of generally annular unwoven fabric rings having predetermined thicknesses and being respectively mounted to the inner surface of said major wall portions of the casing and extending inwardly therefrom, said rings each having an inner face respectively opposed to the opposite sides of the outer margin of the recording disk, with the thickness of the unwoven fabric rings being selected so that said inner faces of said rings are spaced from the outer margin of the recording disk while the disk is rotated at high speed and prevent the recording surface from coming into contact with said inner surfaces when the recording disk is at rest.

4,622,619

DECOUPLING CAPACITOR AND METHOD OF MANUFACTURE THEREOF

Donald P. Schilling, Albuquerque, N. Mex.; Raymond C. Jodoin, Scottsdale, and Joseph E. Johnston, Chandler, both of Ariz., assignors to Rogers Corporation, Rogers, Conn.

Filed Mar. 13, 1985, Ser. No. 711,478
Int. Cl.[4] H01G 9/05, 7/00, 4/10
U.S. Cl. 361—306 34 Claims



13. A capacitor including:

a first substantially planar electrical conductor;

a second substantially planar electrical conductor, said second electrical conductor being coplanar with said first electrical conductor;

a first active lead extending from said first conductor at a first position;

a second active lead extending from said second conductor at a second position;

a first dummy lead associated with said first conductor, but electrically isolated therefrom at a third position;

a second dummy lead associated with said second conductor, but electrically isolated therefrom at a fourth position;

at least a portion of said first and second active leads and said first and second dummy leads being coplanar with each other and with said first and second conductors;

a multilayer capacitive element between said first and second conductors, said capacitive element having first and second conductive end surfaces, with said first conductive end surface being in electrical contact with said first conductor and said second conductive end surface being in electrical contact with said second conductor; and

a molded encapsulating cover encapsulating said conductors and capacitive element, with said active and dummy leads extending from said encapsulating cover at said first, second, third and fourth positions.

4,622,620

ELECTRIC CAPACITOR WITH POLYETHYLENE TEREPHTHALATE AS A DIELECTRIC FOR USE AS A SOLDERABLE CHIP COMPONENT

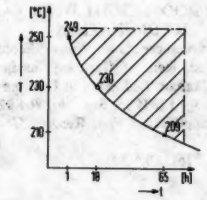
Hartmut Michel, Heidenheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,729

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412463

Int. Cl.⁴ H01G *4/08, 7/00*

U.S. Cl. 361—323 **12 Claims**



1. An electric capacitor, comprising:

dielectric layers provided on at least one side with metal layers as coatings so as to form a capacitor body wherein the dielectric layers are formed of partially crystallized and pre-shrunk polyethylene terephthalate;

the dielectric layers being arranged to form a stack;

the coatings being electrically conductively alternately connected to respective metal layers applied to end faces of the capacitor body; and

the degree of crystallization of the dielectric layers formed of polyethylene terephthalate being at least 50% as measured by differential thermo-analysis in order to determine a melting point enthalpy.

4,622,621

CHIP CARRIER FOR HIGH FREQUENCY POWER COMPONENTS COOLED BY WATER CIRCULATION

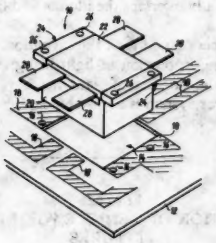
Lucien Barre, Tours, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 9, 1985, Ser. No. 807,019

Claims priority, application France, Dec. 11, 1984, 84 18927

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—382 **1 Claim**



1. In a chip carrier for power electronic components, comprising a heat conducting main body having a cavity for housing at least one component, as well as recesses formed in the main body and apertures for access to these recesses for introducing and discharging a forced flow cooling fluid,

over a part of its periphery, said main body is provided with a projecting flange having a lower flat surface forming a bearing surface on which the body of the chip carrier is inserted in a window cut out in a printed circuit board;

over another part of the periphery of the main body, flat electrodes extend from the cavity, in which they are connected to the component, these electrodes having their lower face situated in the plane of said bearing face so that when the body of the chip carrier is inserted in said window the electrodes come to bear against connections printed on the board, which connections extend substantially to the edge of the window;

apertures for access to said recesses are placed below the plane of the bearing surface and at a sufficient distance from this plane for it to be possible, when the body of the chip carrier is placed in the window of the board, to connect to these apertures fluid delivery and discharge ducts which are consequently situated on the other side of the supporting board with respect to the flat electrodes.

4,622,622

HEADLAMP SYSTEM FOR SMALL VEHICLES

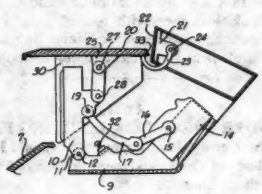
Masayoshi Baba, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 540,426, Oct. 7, 1983, abandoned. This application Mar. 19, 1985, Ser. No. 714,048

Claims priority, application Japan, Oct. 8, 1982, 57-177327

Int. Cl.⁴ B60Q *1/06*

U.S. Cl. 362—65 **5 Claims**



1. A motorcycle having a headlamp system comprising:

a front leg shield on the motorcycle, said front leg shield having a forward opening cavity therein,

a headlamp support bracket positioned inside said front leg shield behind the forward opening of said cavity to define at least the lower boundary of said cavity,

pivot arms pivotally mounted to said headlamp support bracket,

a headlamp connected to each side to said pivot arms, said headlamp pivoting on said pivot arms from a position forward in said cavity to a vertical position such that said headlamp projects light forward from said motorcycle,

means for pivoting said headlamp into said forward position in said cavity including a motor driven shaft, a rotating arm rigidly attached to one end to said shaft, a connecting rod pivotally attached at one end to the other end of said rotating arm and pivotally attached at the other end to the rear of said headlamp such that rotation of said shaft pivots said headlamp into said vertical position,

a lid for closing said forward opening cavity in said front leg shield, said lid including a curved connecting rod rigidly attached thereto at one end and pivotally connected at the other end to a pivot bracket mounted behind said front leg shield, and

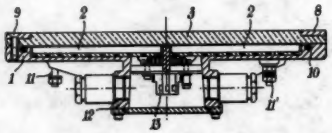
lid opening means including a lid connecting rod pivotally connected at one end to said headlamp and pivotally connected at the other end to said lid such that said lid is pivoted upward and outward from the forward opening in said cavity upon said pivoting of said headlamp.

4,622,623

LUMINOUS SIGNALLING PLATE, PARTICULARLY SUITABLE FOR THE INSTALLATION ON THE DECK OF A SHIP

Dino Zei, Florence, Italy, assignor to Officine Panerai S.r.l., Florence, Italy

Continuation of Ser. No. 483,503, Apr. 11, 1983, abandoned. This application Mar. 5, 1985, Ser. No. 708,114
Claims priority, application Italy, Apr. 21, 1982, 48264 A/82
Int. Cl.[4] F21V 9/16
U.S. Cl. 362—84 8 Claims



1. A luminous signalling plate for runways on ship decks, comprising

a shallow housing having an open face;

at least one flat electroluminescent element replaceably mounted within said housing;

a transparent screen removably mounted from the flat electroluminescent elements mounted on the housing over the flat electroluminescent element and enclosing the open face of the housing;

means making the enclosing of the open face hermetically tight;

means on said housing for mounting said signalling plate in a ship deck flush therewith; and

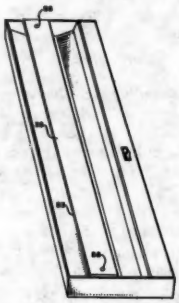
electric connection means for connecting said electroluminescent element to an electric current source.

4,622,624

UNDER SHELF TASK LIGHTING FIXTURE

David G. McCarthy, Huntington, and Ronald R. Eichorn, New Haven, both of Conn., assignors to Electri-Cable Assemblies, Inc., Shelton, Conn.

Continuation of Ser. No. 502,945, Jun. 10, 1983, abandoned. This application May 17, 1985, Ser. No. 735,396
Int. Cl.[4] F21S 3/00; F21V 11/04
U.S. Cl. 362—217 8 Claims



1. An electrical lighting fixture comprising:

A. a light source and a longitudinally oriented housing for receiving said light source;

B. a reflector within said housing and having a light emitting opening therein;

C. a perforated panel part movably mounted to said longitudinally oriented housing and extending over substantially less than 100% of said opening; and

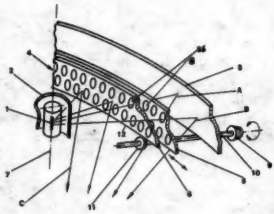
D. means for selectively moving said perforated panel part in a direction which is transverse to said longitudinally oriented housing for selectively modifying the direction in which light is emitted from said fixture such that the majority of said emitted light may be directed forwardly of said fixture, rearwardly of said fixture, or both forwardly and rearwardly of said fixture, depending upon the transverse position of said panel part relative to said housing.

4,622,625

OPERATING-ROOM LIGHT WITH VARIABLE ILLUMINATION

Helmut Becker, Nuremberg, and Walter Wohlfart, Kleinostheim, both of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 764,922
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1984, 3432745
Int. Cl.[4] F21V 7/04
U.S. Cl. 362—304 12 Claims



1. Operating-room light having

a light source (1);

a first, fully reflective main mirror system (3) located in the path of light from the source and directing light from the source in a predetermined direction (A, B) to provide an illuminated field;

a second mirror system (4, 42, 43) which is partially light transmissive and partially light reflective, said second mirror system being located in the path of light between the source (1) and the first, or main mirror system (3), and directing light from the source in a path (C, C', C'') which at least partially overlaps the illuminated field, and having means

whereby, in accordance with the invention,

the ratio of the proportion of light being transmitted with respect to the portion of light being reflected by said second mirror system is adjustable and controllably variable.

4,622,626

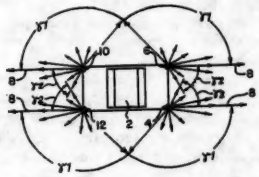
COMBINATION OF VEHICLE WITH LIGHTING FIXTURES

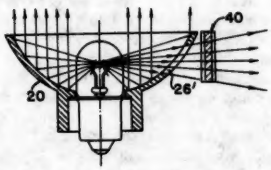
Knut O. Sassmannshausen, 5 Pinewood Estate, Wexford, Ireland

Continuation-in-part of Ser. No. 533,611, Sep. 16, 1983, Pat. No. 4,559,589, which is a continuation of Ser. No. 121,022, Feb. 13, 1980, abandoned. This application Oct. 9, 1985, Ser. No. 785,870
Int. Cl.[4] F21V 7/00
U.S. Cl. 362—30 J 36 Claims

1. The combination comprising a vehicle having a front and a rear end and two opposite sides located therebetween, and lighting means disposed at said front and rear ends and having means for directing rays of light in respective main beams extending forwardly of said front end and rearwardly of said

rear end and in fan-like fashion rearwardly from said front end and forwardly from said rear end along said two opposite sides





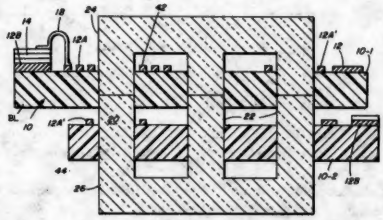
so that the fan-like rays from said front and rear ends overlap and the vehicle is completely surrounded by light.

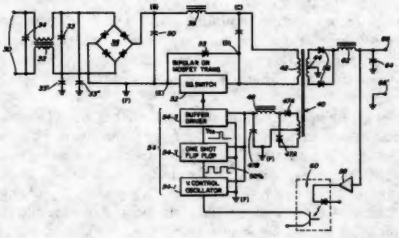
4,622,627

SWITCHING ELECTRICAL POWER SUPPLY UTILIZING MINIATURE INDUCTORS INTEGRALLY IN A PCB

Edward Rodriguez, Winchester, and Alexander Estrov, Brookline, both of Mass., assignors to Theta-J Corporation, Wakefield, Mass.

Filed Feb. 16, 1984, Ser. No. 580,615
Int. Cl.[4] H02M *5/458, 3/335*
U.S. Cl. 363—37 10 Claims





1. Electrical power supply comprising, in combination:

(a) means for converting a line a.c. to d.c. and applying a resonant pulsation thereto at an operating frequency of at least 1.0 megahertz,

(b) means defining a transformer with primary and secondary windings formed on surface areas of printed circuit board (PCB) means with inductive coupling material passing through the PCB substrate at primary and secondary winding locations thereon, such material forming an essentially closed magnetic loop outside the PCB, the primary and secondary winding turn ratio being selected to provide voltage step-down, current step-up,

(c) means for applying said resonant pulsed d.c. to a transformer primary winding and applying a transformer secondary winding's induced pulse current to output terminals via rectifier and filter means, as a low voltage d.c.,

(d) said resonant circuit means comprising switching means therein to control the pulsed current applied to the primary winding of the transformer,

(e) voltage feedback means connected from the transformer secondary circuit to said resonant pulsation control switch to control pulsation,

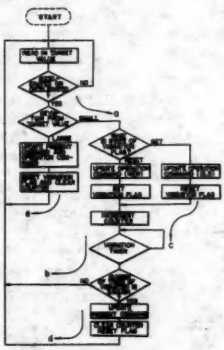
and (f) means for establishing a common thermal plane of the heat generating components of said power supply including at least the magnetic loop defining means of said transformer.

4,622,628

PWM INVERTER APPARATUS WITH DIGITAL CONTROL

Shigeru Murasaki, Narashino; Motonobu Hattori, Funabashi; Akira Ishibashi, Tokyo, and Kenji Nandoh, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 623,085
Claims priority, application Japan, Jun. 22, 1983, 58-110882
Int. Cl.[4] H02M *1/12;* H02P *5/00*
U.S. Cl. 363—37 15 Claims



1. A PWM inverter apparatus with digital control comprising:

a variable frequency inverter means for converting DC power to AC power,

an oscillation control circuit means for controlling stepwise said inverter means in response to a command value,

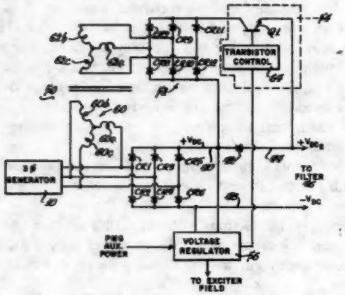
memory means for storing a present command value and a new command value, and

operation control means for controlling said oscillation control circuit means by reading out said present command value and said new command value from said memory means for repetitively alternately applying said present command value and said new command to said oscillation control circuit means so that said command value for said oscillation control circuit means is updated.

4,622,629
POWER SUPPLY SYSTEM WITH IMPROVED TRANSIENT RESPONSE

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 12, 1984, Ser. No. 660,150
Int. Cl.[4] H02J *1/10*
U.S. Cl. 363—70 **12 Claims**



1. In a power supply providing power to a load wherein the power supply includes an alternator and a first rectifier for converting the alternator output into a primary DC voltage, the improvement comprising:

a second rectifier coupled to the alternator output for converting the alternator output into supplemental DC power;

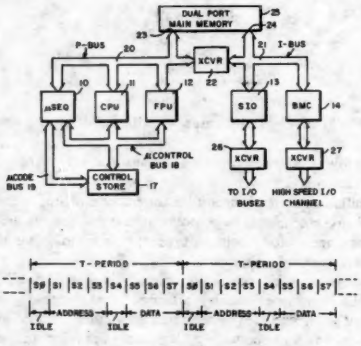
means for sensing the level of the primary DC voltage; and

a controlled switch coupled between the second rectifier and the load and controlled by the sensing means wherein the switch is closed to couple the supplemental DC power to the load when the level of the primary DC voltage drops to a particular value.

4,622,630
DATA PROCESSING SYSTEM HAVING UNIQUE BUS CONTROL PROTOCOL

Chandra R. Vora, Northboro; Michael L. Ziegler, Whitinsville, both of Mass.; Mark Bagula, Morgan Hill, and Steve Hamilton, Los Gatos, both of Calif., assignors to Data General Corporation, Westboro, Mass.

Filed Oct. 28, 1983, Ser. No. 546,514
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—134 **13 Claims**



1. A data processing system for preventing bus conflicts in the placing of data and address information on a common bus means when multiple system components attempt to place said information substantially concurrently on said common bus means, said system components including a central processing unit, one or more shared memory units, and one or more input-/output units, and said common bus means providing for the transfer of said information among said system components, said system comprising

means connection to all system components for generating a clock signal to provide a plurality of information transfer time periods, each transfer time period comprising a plurality of more than two subperiods for use in controlling access to said common bus means by said system components;

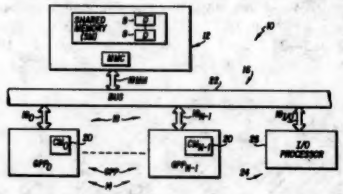
means at each system component capable of accessing said common bus means for placing on said common bus means address information for defining a type of bus cycle operation and addresses for said bus operation during a plurality of address subperiods there being idle subperiods before and after said address subperiods;

means in each said system component responsive to the placing of information on said common bus means by one of said system components for inhibiting the placement of subsequent information on said common bus means by any other said system component, the use of said idle subperiods thereby preventing said bus conflicts.

4,622,631
DATA PROCESSING SYSTEM HAVING A DATA COHERENCE SOLUTION

Steven J. Frank, Mountain View, and J. Scott Merritt, Newark, both of Calif., assignors to Plexus Computers, Inc., San Jose, Calif.

Filed Dec. 27, 1983, Ser. No. 567,233
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **49 Claims**



1. A system for processing data partitioned into blocks of data, each block of data being identified by an address, comprising:

(a) addressable main memory means for storing the blocks of data;

(b) a plurality of processor means for accessing the blocks of data, each of said processor means having addressable secondary memory means for storing a number of the blocks of data;

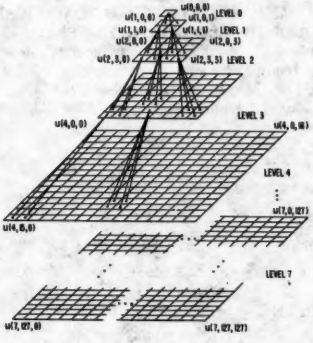
(c) bus means for intercoupling said plurality of processor means with said addressable main memory means and for intercoupling each one of said plurality of processor means with any other of said plurality of processor means; and

(d) wherein only one of said addressable main memory means and said plurality of processor means is a current owner of an address of a block of data, wherein said current owner has the correct data for the owned address, wherein ownership of an address is dynamically changeable among said addressable main memory means and said plurality of processor means, and wherein an address of a block of data has associated with it usage mode information identifying the use that can be made of the block of data.

4,622,632
DATA PROCESSING SYSTEM HAVING A PYRAMIDAL ARRAY OF PROCESSORS

Steven L. Tanimoto, and Joseph J. Pfeiffer, Jr., both of Seattle, Wash., assignors to Board of Regents, University of Washington, Seattle, Wash.

Filed Aug. 18, 1982, Ser. No. 409,348
Int. Cl.[4] G06F *15/16, 15/66*
U.S. Cl. 364—200 26 Claims



1. A data processing system for use in processing a pyramidal data structure having a first data level fncluding a first matrix of first level data elements and a second data level including a second matrix of second level data elements greater in number than the first data elements, said system comprising:

first level processing means comprising a plurality of first level processors;

first level memory means comprising a plurality of sets of first level storage devices, each of said first level storage devices including means for storing a different one of said first level data elements and each of said sets of said first level storages devices being coupled tp a different one of said plurality of first level processors;

second level processing means comprising a plurality of second level processors;

second level memory means comprising a plurality of sets of second level storage devices, each of said second level storage devices including means for storing a different one of said second level data elements and each of said sets of said second level storage devices being coupled to a different one of said plurality of said second level processors; and

processor control means, electrically coupled to each of said first level processors and each of said second level processors, for generating and sending control signals to said first level processors and said second level processors to cause said first and second level processors to perform processing operations in synchrony upon said first level data elements and said second level data elements, respectively.

4,622,633
OBJECT BUILDING METHOD FOR SELF CONFIGURING COMPUTER NETWORK

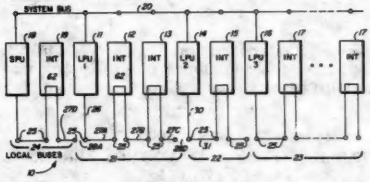
Claude R. Ceccon, and Joseph N. Kovara, both of Tucson, Ariz., assignors to Tri Sigma Corporation, Scottsdale, Ariz.

Filed Dec. 6, 1983, Ser. No. 558,783
Int. Cl.[4] G06F *15/16, 13/40, 9/00*
U.S. Cl. 364—200 5 Claims

1. A method of operating a computer system including a first processor and a plurality of removable interface circuits, said method comprising the steps of;

(a) storing in a data base accessible by the first processor a plurality of hardware descriptors each of which includes a separate identifier for each of said interface circuits that can be plugged into said computer system, and also storing in said data base a plurality of component lists each corresponding to a separate one of said plurality of interface circuits and each including a name and at least one attribute of each component of that interface circuit, and also storing in said data base a plurality of software templates each including descriptions of data structures for containing data descriptive of various ones of said components, data to be entered into said data structures, names of code elements to be included in a siftware object to be built representing a particular one of said interface circuits, and pointers to code to be executed to build such software objects;

(b) obtaining a first one of said hardware descriptors, corresponding to a first one of said interface circuits, from said date base;



(c) using said first hardware descriptor to obtain from said data base a first one of said lists of components of said first interface circuit;

(d) using the name of a first one of the components of said first component list to obtain from said data base a first one of said software templates corresponding to a first one of the components of said first interface circuit;

(e) using said first software template to build a first software object that represents at least one function that can be performed by said first component;

(f) assigning a first object name to said first software object and entering said first object name and said first software object into said data base; and

(g) using said first object name, during execution of a user process, to obtain said first software object from said data base and operating upon said first software object to measure a signal produced by said first component or to apply a signal to a terminal of said first component.

4,622,634
PARALLEL PROCESSING OF SIMULTANEOUS ULTRASOUND VECTORS

Howard F. Fidel, Hartsdale, N.Y., assignor to Irex Corporation, Ramsey, N.Y.

Filed Mar. 18, 1983, Ser. No. 476,672
Int. Cl.[4] G01S *7/52, 7/62;* G06F *13/00, 15/42*
U.S. Cl. 364—414 8 Claims

1. In an ultrasonic diagnostic imaging system, apparatus for processing simultaneous first and second ultrasonic vector information signals, each of which comprises a sequence of digital words, comprising:

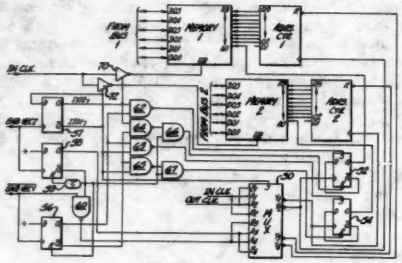
a first digital memory having an input and an output;

means, responsive to said simultaneous vector information signals, for alternately steering words of said first and second vector information signals to the input of said first memory;

first address means, coupled to said first memory, for addressing sequential locations of said first memory in synchronism with the arrival of words of vector information at said input of said first memory so as to load words of said respective vector information signals alternately into sequential memory locations;

control means, coupled to said first address means, for controlling said first address means to read vector information

signal words from sequential even memory locations of said first memory and from sequential odd memory locations of said first memory; and

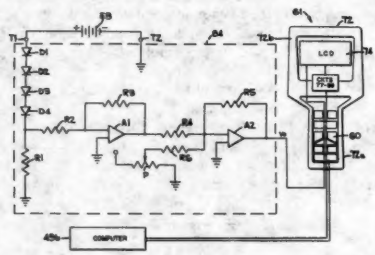


a scan converter, coupled to said output of said first memory for receiving vector information signal words read from said first memory under control of said control means.

4,622,635
PORTABLE DISPLAY AND CONTROL TERMINAL FOR WELLS

Rangasami S. Chandra, Walnut Creek, and Jose F. Reyes, Newark, both of Calif., assignors to Automated Controls Inc., Denver, Colo.

Filed Feb. 13, 1984, Ser. No. 579,746
Int. Cl.[4] G06F *15/20*; G02F *1/13*
U.S. Cl. 364—422 **7 Claims**



1. A portable graphic display terminal for use with a well production control system having a first transducer for generating a signal representative of a load on a sucker-rod string and a second transducer for generating a signal representative of a position of said rod string, said terminal having means for monitoring well conditions and for supplying control parameters to said control system, said terminal comprising:

a liquid crystal display module for displaying data from said control system;

keyboard means for entering display command signals and system control signals into said terminal;

means for connecting said terminal to said control system;

a source of potential having first and second output terminals; and

a temperature compensating circuit connected between said display module and said first output terminal for supplying an operating voltage to said display module which keeps the brightness contrast of said display module substantially constant over a range of operating temperatures, said temperature compensating circuit including:

a plurality of diodes each having an anode and a cathode,

means for connecting the anode of a first diode to said first output terminal of said source,

means for serially connecting the diodes with the anode of each of the other diodes connected to the cathode of an adjacent diode,

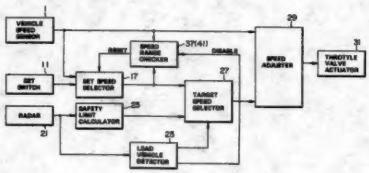
an electrical impedance connected between said second output terminal of said source and the cathode of a last of said diodes, and

means for connecting said cathode of said last diode to said crystal display module.

4,622,636
SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING VEHICLE SPEED

Akira Tachibana, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 14, 1984, Ser. No. 609,973
Claims priority, application Japan, May 23, 1983, 58-76028[U]
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—424 **8 Claims**



1. A system for automatically controlling a speed of an automotive vehicle, comprising:

(a) first means for detecting whether another vehicle is moving within a predetermined detectable range in the same direction as the controlled vehicle;

(b) second means for adjusting the controlled vehicle speed toward a manually set vehicle speed so as to hold the current controlled vehicle speed approximately constant at said set speed when said first means detects that no other vehicle is moving within said predetermined detectable range;

(c) third means for measuring an intervehicle distance from the controlled vehicle to the other vehicle when said first means detects that the other vehicle is moving within the predetermined detectable range;

(d) fourth means for detecting the vehicle speed of the controlled vehicle;

(e) fifth means for calculating an intervehicle distance from the controlled vehicle to the other vehicle on the basis of the detected vehicle speed;

(f) sixth means for adjusting the controlled vehicle speed to a set vehicle speed so as to follow said other vehicle with the safe intervehicle distance calculated by said fifth means on the basis of the vehicle speed detected by said fourth means when the intervehicle distance measured by said third means exceeds the safe intervehicle distance and for adjusting the controlled vehicle speed to a speed to increase the measured intervehicle distance when the intervehicle distance measured by said third means is shorter than the safe intervehicle distance calculated by said fifth means;

(g) seventh means for detecting whether the vehicle speed detected by said fourth means is out of a predetermined speed range with respect to the controlled vehicle speed set by said second means after a predetermined time has elapsed after said first means detects that the other vehicle has disappeared out of the predetermined detectable range; and

(h) eighth means for disabling the function of said second means when said seventh means detects that the controlled vehicle speed detected by said fourth means is out

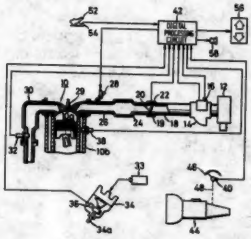
of said predetermined speed range after said predetermined time has elapsed.

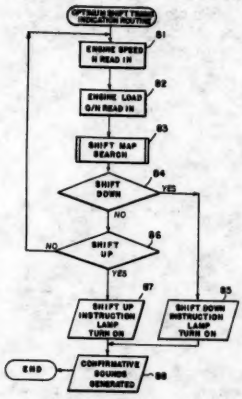
4,622,637

OPTIMUM SHIFT TIMING INDICATING DEVICE FOR A VEHICLE

Kazuo Tomita, Gotenba, and Kouhei Igarashi, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 22, 1983, Ser. No. 534,696
Claims priority, application Japan, Oct. 4, 1982, 57-174378
Int. Cl.⁴ B60K *41/18*; G09B *19/16*; G07C *5/08*
U.S. Cl. 364—424.1 **20 Claims**





19. An optimum shift-timing-indicating device for a vehicle comprising:

an engine speed sensor for detecting a rotational speed of an engine;

a load sensor for detecting an engine load;

data processing means having at least one data map so that a number of data maps is fewer in number than gear positions of a transmission of said vehicle, said at least one data map having a set shift-up region varying in accordance with the rotational speed of the engine and the engine load, for emitting a shift-up instruction signal in accordance with the detected rotational speed of the engine and the detected engine load; and

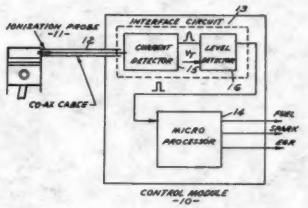
shift instructing means for giving a driver a shift-up instruction in response to the instruction signal output from said data processing means.

4,622,638

IONIZATION PROBE OUTPUT INTERFACE CIRCUIT

Robert L. Anderson, Saline, and William R. McDonald, Westland, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1983, Ser. No. 564,442
Int. Cl.⁴ F02P *5/14*
U.S. Cl. 364—431.08 **3 Claims**



1. An ionization probe interface circuit means for improving the response time of an ionization probe by eliminating the capacitive effect of a coaxial cable coupling said ionization probe and said ionization probe interface circuit means, said ionization probe interface circuit means including:

an operational amplifier means for applying a constant bias voltage to said coaxial cable, said operational amplifier means applying a positive voltage bias to said ionization probe with respect to a ground potential;

current detector means coupled to said ionization probe through said coaxial cable for producing a voltage pulse in response to a current output from said ionization probe;

a level detector coupled to said current detector means for producing a square wave pulse in response to a voltage output from said current detector means; and

a microprocessor means coupled to said level detector for generating signals controlling engine operating parameters in response to the square wave output of said level detector.

4,622,639

AIRCRAFT CENTER OF GRAVITY AND FUEL LEVEL ADVISORY SYSTEM

Richard L. Adelson, Augusta, and Franklin D. Nusbaum, Jr., Wichita, both of Kans., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 16, 1983, Ser. No. 562,206
Int. Cl.⁴ G01M *1/12*
U.S. Cl. 364—463 **11 Claims**

10. An aircraft center of gravity and fuel level advisory system for fixed wing aircraft connected to the aircraft's fuel gauges and operated by one of the aircraft's personnel, the system comprising:

a control panel processor unit connected to the aircraft's power source and fuel gauges, the processor unit including a computer and memory for storing and calculating aircraft weight, center of gravity, fuel consumption and transfer, the weight and center of gravity shift of internal and external payload items as they are expended;

a keyboard mounted on the processor unit and connected thereto, the keyboard having a power on/off switch, a fuel level switch, a load switch and a weight switch; and

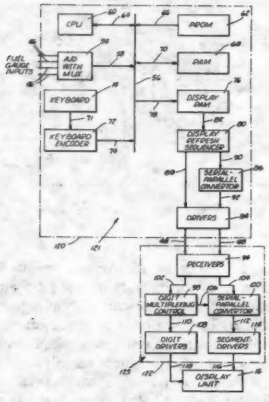
a remote display unit connected to the processor, the display unit including:

display of the aircraft's center of gravity when the fuel switch is activated, the center of gravity display designed to alert aircraft personnel of the center of gravity change as the fuel load changes and when a load is released from the aircraft during flight and visually flashes when a center of gravity limit is being approached;

display of the number of external and internal loads which can be released without exceeding the aircraft's center of gravity limit when the fuel level switch is activated;

display of a fuel tank code, fuel level and fuel differential between the actual fuel level and a selected burn down to fuel level when the fuel level switch is activated;

display of a wing tank code with a non-symetrical fuel



quantity relative to its opposite wing tank code when the fuel level switch is activated;

display of the number and placement of external and internal loads on the aircraft and their location on the aircraft when the load switch is activated; and

display of the gross weight of the aircraft, the total fuel weight of the aircraft and individual fuel tank weight when the weight switch is activated.

4,622,640

POWER LOAD SURVEY APPARATUS

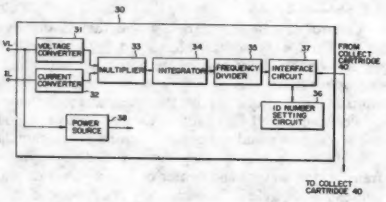
Yukio Shimamura, Chigasaki; Yoshihiro Tsukuda, and Ikuo Maeda, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 25, 1983, Ser. No. 517,051

Claims priority, application Japan, Jul. 29, 1982, 57-132438

Int. Cl.[4] G01R *21/00*

U.S. Cl. 364—483 **5 Claims**



1. A power load survey apparatus comprising:

electronic power sensing means for multiplying a signal proportional to a load voltage by a signal proportional to a load current, and producing a multiplication signal indicative thereof and for converting said multiplication signal to a pulse signal which is then outputted as a power load amount;

collector cartridge means, detachably coupled to said electronic power sensing means, for receiving said pulse signal from said electronic power sensing means when said collector cartridge means is coupled thereto, said collector cartridge means having: (a) a counter having an ID number setting circuit for outputting an ID number signal and for counting said pulse signals indicative of said power load amount when said collector cartridge means is coupled to said electronic power sensing means to produce an output signal indicative thereof, (b) memory means, coupled to said counter for storing said output from said counter, (c) a time keeping circuit coupled to said memory means for causing time data to be stored in said memory means at intervals of a determined length, and (d) power source means for supplying a supply voltage to said collector cartridge means, said collector cartridge means being an interchangeable unit; and

memory and magnetic tape converting means, detachably coupled to said collector cartridge means, and including (a) a magnetic tape device for transferring thereto and recording therein data stored in said collector cartridge means when said memory and magnetic tape converting means is coupled to said collector cartridge means, (b) a standard clock keeping a standard time, and (c) time rectification means for applying said standard time of said standard clock to said time keeping circuit of said collector cartridge means when said memory and magnetic tape means is coupled to said collector cartridge means to thereby cause said time keeping circuit to be time rectified to said standard time;

wherein said collector cartridge means further includes (e) converting means for coupling to said memory and magnetic tape converting means to receive said time data from said standard clock and for applying said time data to said time keeping circuit.

4,622,641

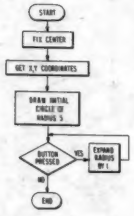
GEOMETRICAL DISPLAY GENERATOR

Lawrence K. Stephens, Dallas, Tex., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 13, 1983, Ser. No. 531,651

Int. Cl.[4] G06F *15/40, 15/626*

U.S. Cl. 364—518 **5 Claims**



1. A process for user interactive generation and display of a geometrical figure on a graphics display screen comprising the steps of

prompting the user to choose a desired geometrical figure to be drawn on the graphics display screen from a list of geometrical figures,

prompting the user to point to a location on the graphics display screen where it is desired to generate the chosen geometrical figure, the pointing being accomplished by the user positioning a cursor on the graphics display screen at the desired location with a cursor pointing device and pressing a key to signify selection of a location,

responding to the pressing of the key by the user to signify selection of a location by removing the cursor from the graphics screen and drawing the smallest representation of the selected geometrical figure at the selected location, the user thereafter inputting a signal requesting enlargement of the geometrical figure, and

responding to the user input signal requesting enlargement of the geometrical figure by enlarging the geometrical

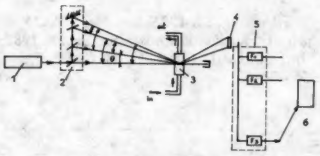
figure in increments of one pixel until a second user input signal is received indicating the desired termination of the geometric figure expansion, and thereafter re-displaying the cursor while displaying the enlarged geometrical figure.

4,622,642

BATCH INTERFERENCE GRANULOMETRIC PROCESS PARTICULARLY APPLICABLE TO POLY-DISPERSED BIOLOGICAL PARTICLES

Jean Bajard, "Le Vallon", 5, rue Charles Baudelaire, 67370 Griesheim-Sur-Souffel, and Jean-Paul Méric, 10, rue du Docteur Roux, 75015 Paris, both of France

Filed Feb. 3, 1983, Ser. No. 463,576
Claims priority, application France, Feb. 3, 1982, 82 01843
Int. Cl.[4] G01N *15/02*
U.S. Cl. 364—555 4 Claims



1. Process for batch interferential granulometry useful particularly for poly-dispersed biological particles, characterized by a combination of steps consisting in:

suspending the particles to be analyzed in a fluid in which they are distributed at random

moving said particles and fluid with uniform speed through a fluid pathway including one measuring volume in which the particles may be illuminated when they cross said volume

illuminating said particles simultaneously by at least two beams of coherent light with convergent axes, thus producing in the measuring volume a network of interference fringes

measuring the light flux diffracted by said illuminated particles in at least one solid angle

setting the concentration of said particles in said fluid so that at each instant a group of particles are simultaneously illuminated in said measuring volume

setting the angles between said coherent beams, and thus the interference fringe distances, at values defined according to an interative computation process

setting the position and the limits of said solid angles as a function of the granulometric measurement to be made, these position and limits being obtained by said special iterative computation process involving also the said interference fringe distances

using only the alternative components of the measurement signals representing the flux diffracted by said particles in said solid angles

treating, when the particles are illuminated by more than two beams, these alternative components by a Fourier Analysis device in order to separate the various frequencies which are present in these components

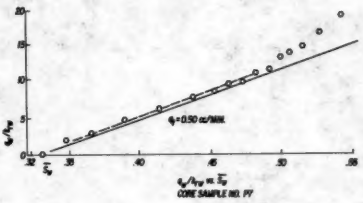
treating the obtained results in a treatment module in order to calculate the sought granulometric characteristics.

4,622,643

METHOD FOR DETERMINING CONSISTENT WATER RELATIVE PERMEABILITY VALUES FROM DYNAMIC DISPLACEMENT DATA

Billy J. Dotson, Grand Prairie, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,176
Int. Cl.[4] G01N *15/08*
U.S. Cl. 364—556 7 Claims



1. A method for determining correct relative water permeability values for a core sample, comprising the steps of:

performing oil flood dynamic displacement measurements on said core sample;

determining characteristics of said core sample;

determining from data collected during said measurements, and from said characteristics of said characteristics of said core sample relative water permeability values (k_{rw}) for said core, said determined relative water permeability values (k_{rw}) being offset from correct relative water permeability values (k_{rwc}) as a result of an end-effect which introduces an increased fluid pressure drop at an effluent end of said core sample; and

correcting said determined relative water permeability (k_{rw}) values toward said correct relative oil permeability values (k_{rwc}) thereby minimizing the effects caused by said end effect on said determined relative oil permeability values (k_{rw}), and wherein said correcting step comprises the steps of:

initially plotting a ratio q_w/k_{rw} vs. average fluid saturation of said core sample, where q_w is the rate of water produced at the effluent end of said core sample during said oil flood dynamic displacement measurement;

determining an initial relative water permeability value k_{rwi} at a residual water saturation of said core sample, said value k_{rwi} being used to determine the first point of the plot of q_w/k_{rw} vs. average fluid saturation;

determining if a straight line segment exists in said plotted ratio in areas thereof corresponding to high oil saturation and, if so, drawing and extrapolating said straight line segment to the limit of the plotted data, otherwise, constructing a tangent line to the plotted ratio beginning at the point corresponding to k_{rwi};

producing a straight line in parallel with said straight line segment or said tangent line, said produced straight line passing through an irreducible water saturation value S_{iw}; and

determining corrected relative water permeability values k_{rwc}, where

$$k_{rwc} = k_{rw} \frac{(q_w/k_{rw})}{(q_w/k_{rw})SL}$$

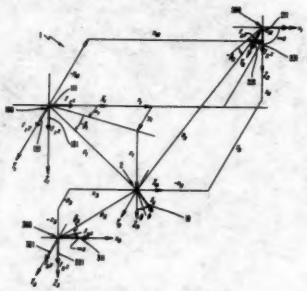
and (q_w/k_{rw}) is the initially plotted ratio and $(q_w/k_{rw})SL$ is the value appearing on the produced straight line for the same average fluid saturation value.

4,622,644

MAGNETIC POSITION AND ORIENTATION MEASUREMENT SYSTEM

Per K. Hansen, Burlington, Vt., assignor to Position Orientation Systems, Ltd., Burlington, Vt.

Filed May 10, 1984, Ser. No. 609,014
Int. Cl.[4] G01B 7/00
U.S. Cl. 364—559 13 Claims



1. A magnetic position and orientation measurement system, comprising:

(a) a three dimensional space of known dimensions;

(b) an object located within said space, the position and orientation of which is to be measured;

(c) a single elongated bar permanent magnet fixedly attached to said object; and

(d) a plurality of three-axis Hall-effect antennas mounted within said space for sensing the magnetic field of said permanent magnet, each axis of each said antenna being substantially parallel to a corresponding axis of all other ones of said antenna;

(e) said antennas being connected to electrical circuitry enabling the inputting thereto of data related to the magnetic field of said permanent magnet as sensed by said antennas and therefrom calculating the position and orientation of said permanent magnet and thereby of said object.

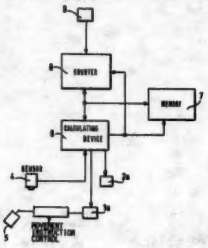
4,622,645

METHOD AND APPARATUS FOR DETERMINING THE PRESENCE OF GAPS BETWEEN TEXTILE FIBER BALES

Fritz Hösel, Möchengladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Division of Ser. No. 414,948, Sep. 3, 1982, Pat. No. 4,536,852. This application Jul. 1, 1985, Ser. No. 750,764
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3135272
Int. Cl.[4] G01B 11/10
U.S. Cl. 364—560 8 Claims

1. Method for determining the presence of a gap between textile fiber bales disposed in a row at successive locations in the operative range of a bale opener, the bale opener including a movable carriage movable alongside the row of bales and a turret mounted on the carriage, said method comprising: directly sensing the locations of edges of successive bales which delmit a gap, by means of a distance sensor; and producing an



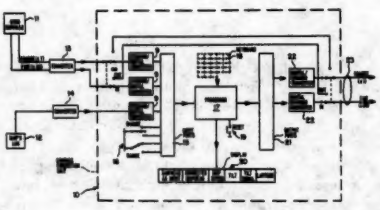
electrical signal responsive to the sensing of each edge location.

4,622,646

ARRANGEMENTS FOR CORRECTING COMPASSES

John C. Waller, Chatswood, Sydney, and Gregory C. L. Searle, Croydon, Sydney, both of Australia, assignors to The Commonwealth of Australia of c/-Department of Defence Support, Australia

Filed Aug. 31, 1983, Ser. No. 528,224
Claims priority, application Australia, Sep. 8, 1982, PF5804
Int. Cl.[4] G01C 19/08, 17/38; G06F 15/31
U.S. Cl. 364—571 16 Claims



1. A method of correcting the output of a marine gyro compass comprising

applying a first signal representative of the speed of a ship to a signal processor,

applying a second signal to the signal processor representative of the output of a marine gyro compass,

producing an output signal being a corrected marine gyro compass output, the corrections being corrections capable of expression by virtue of differential equations and which are solved by numerical method by taking small but finite time increments to linearize the equations with regard to time, the correction factor being updated in this way at regular time intervals,

effecting an initial procedure to feed into a semipermanent data store cooperating with the signal processor values corresponding to a limit of measurable tilt in the gyro compass and said output signal is produced by calculating the rate of change of the tilt up to said limit, the tilt when beyond the limit being also calculated, and

storing values corresponding to the following in said initial procedure: the damping characteristic in the gyro compass, the period term for the damped oscillations in the gyro compass following movement to a new position, and a function representative of the viscosity of the fluid in the tilt determining mechanism of the gyro compass.

4. A method of correcting the outut of a marine gyro compass having an electrolytic level indicator comprising storing

in a signal processor data representative of a limit of measurable tilt in the level indicator, a damping factor (DMP) for the level indicator, a period term (PER) for the level indicator, and a constant (K) being the viscosity characteristic of the electrolytic level indicator,

applying a first signal representative of the speed of the ship to the signal processor.

applying a second signal to the signal processor representative of the output of the marine gyro compass, and

producing an output signal corresponding to the output of the marine gyro compass corrected by a correction factor by taking into account said input data and first and second signals by solving the following differential equations by numerical methods;

$$EDD = -PER.EES - EE.\Phi V.\cos(LAT) + VE.\tan(-LAT)/RG$$

$$EED = -DMP.EES + ED.\Phi V.\cos(LAT)$$

$$EESD = K(EE + AN/G - EES)$$

the solving of the equations being effected by taking small but finite time increments to linearize the equations with regard to time, the correction factor used to produce the corrected output signal being updated at regular time intervals, in the above equations the following notation being used:

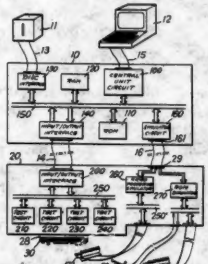
AN; ship north acceleration
ED,EDD; azimuth error and error rate
EE,EED; tilt and tilt rate
EES,EESD; tilt signal and tilt signal rate
G; acceleration due to gravity
DMP; damping term of the level detector
PER; period term of the level detector
K; characteristic viscosity of the compass level detector
LAT; latitude
ΦG; earth angular rotation speed
ΦV; ΦG as corrected by east-west speed
RG; earth's radius
VE,VN; ship east and north velocity.

4,622,647

SYSTEM FOR THE AUTOMATIC TESTING OF PRINTED CIRCUITS

Francois-Regis Sagnard, Paris, and Claude Ruelle, Linas, both of France, assignors to Rank Xerox SA, Puteaux, France

Filed Jul. 22, 1983, Ser. No. 516,261
Claims priority, application France, Jul. 27, 1982, 82 13114
Int. Cl.[4] G06F *11/22*; G01R *31/28*
U.S. Cl. 364—580 **5 Claims**



1. A test system for the centralized automatic testing of microprocessor printed circuit cards, comprising:

a bulk memory device for storing programs relative to tests to be made on each card to be tested;

a standard basic unit having essentially a micro-computer structure and comprising at least: one circuit for connection with the bulk memory device, a central unit circuit having a microprocessor, a read-only memory, a read/-write memory circuit for recording test programs read in from the bulk memory device, an input/output interface circuit comprising means for storing the signals transmitted and received by said input/output interface circuit, and busses connecting said circuits of the basic unit to one another and comprising an address bus, a data bus and a central bus;

a display device connected to said standard basic unit;

specific intermediate units corresponding to the different cards to be tested and each connectable on the one hand to said input/output interface circuit and, on the other hand, to the corresponding card to be tested, whereby a static test can be performed by connecting a card to be tested to the basic unit via the corresponding specific intermediate unit;

a microprocessor simulation circuit connected to said busses of the basic unit and comprising:

means connected to the control bus of the basic unit for generating control signals substantially similar to signals used in the microprocessor of the card to be tested in response to control signals used in the microprocessor of the basic unit;

a generator of faked addresses having an input connected to the address bus of the basic unit and an output connected to an address bus of an interface means, to convert each received address word to a faked address word of which at least a first portion has a selected value; and

comparator means having an input connected to the address bus of the basic unit and an output connected to said means for generating control signals for enabling the generation of a read signal on a control bus of an interface means when the first portion of an address word received by said comparator means has a predetermined value to control reading in a simulated memory zone, whereby a selected zone of a memory plane of the microprocessor of the card to be tested can be simulated in a predetermined zone of the memory plane of the microprocessor of the basic unit;

interface means having the control bus receiving control signals from said means for generating control signals, the address bus connected to the address bus of the basic unit, a data bus connected to the data bus of the basic unit, and means for controlling the flow of data between data busses, and

a gripper connected to the control, address and data busses of said interface means, and adapted to be connected to connection terminals of a package of the microprocessor on the card to be tested, whereby a dynamic test of said card can be performed, including simulation of the microprocessor thereof, by connecting said gripper to the terminals of said package.

4,622,648

COMBINATIONAL LOGIC STRUCTURE USING PASS TRANSISTORS

Sterling R. Whitaker, Chubbuck, Id., assignor to American Microsystems, Inc., Santa Clara, Calif.

Division of Ser. No. 376,895, May 10, 1982, Pat. No. 4,541,067.
This application May 8, 1985, Ser. No. 732,125
Int. Cl.[4] G06F *7/50*; H03K *23/56*
U.S. Cl. 364—715 **5 Claims**

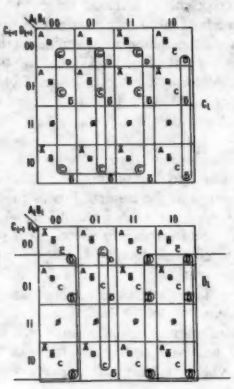
1. A logic circuit including as its basic element PASS transistors wherein each PASS transistor comprises an input lead, an output lead and a control lead for controlling the transmission of signals from said input lead to said output lead, said logic circuit comprising:

an output node; and

a plurality of PASS transistors connected to receive a first input function, a second input function and a third input

function supplied to said input leads and to receive a plurality of selected control signals applied to said control leads of said PASS transistors;

where said first, second and third input functions are a reference voltage VSS, a supply voltage VDD and a carry variable C_{i+1}, said carry variable C_{i+1} input function being supplied to said input leads of two of said PASS transistors, said VSS and said VDD input functions being



separately supplied to said input leads of two other of said PASS transistors, and said selected control signals are input variables to be added, A_i, B_i, said selected control signals, along with their complements $\overline{A}_i$ and $\overline{B}_i$, being supplied to said control leads of said transistors, said input functions and said selected control signals being selectively combined in said PASS transistors, to produce a full adder carry out function at said output node.

4,622,649

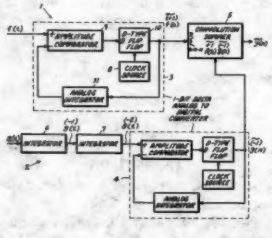
CONVOLUTION PROCESSOR

Ning H. Lu, Parsippany, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,811

Int. Cl.⁴ G06F *15/336;* H04B *14/06*

U.S. Cl. 364—728 **7 Claims**



1. A convolution processor to provide a convolution function for first and second input waveforms comprising:

a first path for one of said first and second input waveforms;

a second path for the other of said first and second input waveforms;

a first delta analog to digital converter means disposed in said first path to convert signals in said first path to a digital version thereof having a delta modulation format;

a second delta analog to digital converter means disposed in said second path to convert signals in said second path to a digital version thereof having said delta modulation format;

convolution summing means coupled to the output of said first and second paths; and

a pair of integrator means each coupled in one of said first and second paths, said convolution function being provided at the output of said convolution summing means, wherein

each of said first and second delta converter means is a one-bit delta analog to digital converter, wherein

each of said one-bit delta converters includes

an amplitude comparator having a first input to receive said signals in the respective path and a second input,

a D-type flip flop coupled to an output of said comparator clocked by a predetermined clock signal to provide at its output said digital version of said signals in said respective path, and

an analog integrator coupled between said output of said flip flop and said second input of said comparator.

4,622,650

CIRCUITRY FOR GENERATING SCALAR PRODUCTS AND SUMS OF FLOATING POINT NUMBERS WITH MAXIMUM ACCURACY

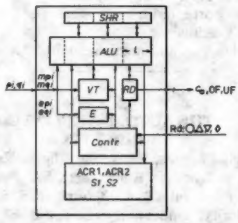
Ulrich Kulisch, Im Eichbaumle 37, 7500 Karlsruhe, Fed. Rep. of Germany

Continuation of Ser. No. 438,561, Nov. 2, 1982, abandoned. This application Aug. 9, 1985, Ser. No. 764,517

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3144015

Int. Cl.⁴ G06F *7/38*

U.S. Cl. 364—748 **12 Claims**

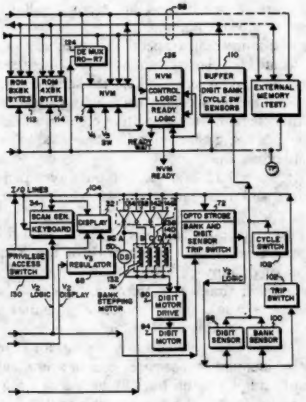


1. In an electronic computer operating in a floating point system and wherein data is defined as a function of (b, l, e_1, e_2) where b is the base, l is the number of digits of the mantissa, e_1 is the least exponent and e_2 is the highest exponent, the improvement comprising means receiving two floating point vectors each having a finite number of vector components for performing a scalar product operation thereon with maximum accuracy wherein the scalar product is produced from a sum of a plurality of partial scalar products of the vector components, including first means for performing fixed point arithmetic operations on the mantissas and exponents of each of the vector components to produce the plurality of partial scalar products, second means receiving the partial scalar products from the first means for storing each partial scalar product in fixed point format in a store having a length L which is $21+2e_2+2$ times greater than the absolute value of e_1; third means receiving the partial scalar products from the second means for summing the stored fixed point partial scalar products; fourth means receiving the summed partial scalar products from the third means for rounding the resulting sum of partial scalar products to the floating point number closest thereto to obtain maximum accuracy; and fifth means receiving the rounded sum from the fourth means for converting the rounded sum into floating point format.

4,622,651
ELECTRONIC POSTAGE METER HAVING PIEZOELECTRIC AUDIO TRANSDUCER ENERGIZED BY STEPPING MOTOR DRIVER CIRCUIT

Alton B. Eckert, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 18, 1983, Ser. No. 486,129
Int. Cl.[4] G08B *21/00*; G06F *15/20*
U.S. Cl. 364—900 **21 Claims**



1. In an electronic meter of the type having settable means for printing postage, an electronic accounting circuits in electrically responsive communication with said printing means, and a value selection control circuit for controlling the value to which said printing means is set, the improvement comprising:

said electronic accounting circuits including a microcomputer in suitable electrical communication with said value selection control circuit to control the operation of said value selection control circuit;

an audible alarm device electrically controlled by said microcomputer, said audible alarm device selectively energized by said microcomputer upon the occurrence of selected precondition of said electronic accounting circuits to emit an audible sound said audible alarm being responsive to a high electrical resonance instigated by said microcomputer;

a housing enclosing said accounting means, said printing means, said value selection control circuit and said audible alarm device to provide mechanical security and electromagnetic radiation shielding for said components; and

said value selection control circuit includes drive means responsive to instigation of said microcomputer and having an inductive load of low electrical resonance for controlling a mechanism with a low response time to energization of said inductive load.

4,622,652
SIGNAL IDENTIFICATION

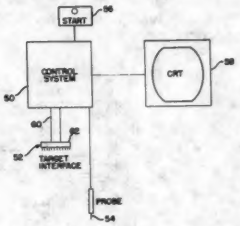
Eugene M. Zumchak, Erie County, N.Y., and William O. Swan, King County, Wash., assignors to Applied Microsystems Corporation, Redmond, Wash.

Filed May 14, 1984, Ser. No. 610,351
Int. Cl.[4] G06F *11/22*
U.S. Cl. 364—900 **16 Claims**

1. A method of identifying nodes in a target system which is microprocessor based comprising the steps of:

a. impressing on the target system a stimulus pattern which would provide responses for the microprocessor associated nodes in the target system which are indicative of the manner of association with the microprocessor;

b. generating a signal corresponding to the response at a node to be identified;



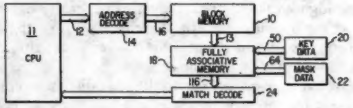
c. comparing the response signal with signals for responses which would be found for nodes associated with the target system microprocessor if it were operating properly; and

d. indicating whether the node is associated with the target system microprocessor if a response match is found.

4,622,653
BLOCK ASSOCIATIVE MEMORY

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 29, 1984, Ser. No. 666,012
Int. Cl.[4] G11C *15/00*
U.S. Cl. 365—49 **25 Claims**



1. A semi-associative memory, comprising:

memory means for storing a plurality of data bits at predetermined memory locations and arranged in word groups, said memory means sectioned into blocks, each of said blocks containing a predetermined number of said word groups;

block access means for accessing each of said blocks in said memory means;

key data means for storing key bits arranged in a key data word group representative of desired search parameters each of the key bits corresponding to one of the data bits in each of said data word groups;

comparison means for simultaneously comparing the key bits of said key data word group with the corresponding data bits in each of said data word groups in the accessed one of said blocks and outputting a match signal for each match between all of the key bits in said key word group and all of the data bits in each of said accessed data word groups; and

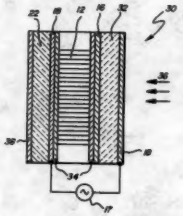
matched decode means for determining the location of each of said data word groups associated with one of said matched signals;

said block access means, said comparison means and said decode means operating simultaneously to determine the memory locations of the matching ones of said data word groups.

4,622,654
LIQUID CRYSTAL LIGHT VALVE WITH MEMORY

Zvi Yaniv, Southfield; David A. Strand, West Bloomfield, and John D. Vala, Rochester, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jan. 16, 1984, Ser. No. 570,980
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—108 5 Claims

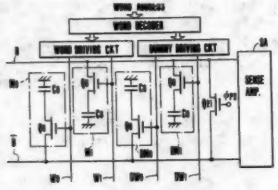


1. A liquid crystal light valve capable of storing the pattern of an input light image comprising:
a layer of liquid crystal;
a dielectric mirror disposed on one side of said liquid crystal layer for reflecting modulated readout light;
a photosensor layer disposed adjacent said dielectric mirror and opposite said liquid crystal layer, said photosensor layer comprising a deposited memory semiconductor material, said material having a first stable state of relatively high electrical resistance and a second stable state of relatively low electrical resistance, said material capable of being switched from one of said states to the other by the application of a threshold stimulus, said semiconductor layer serving to store the pattern of a light input impinging thereon by being selectively switched to said state of low resistance in a pattern corresponding to the pattern of said light input, said regions of low resistance in turn causing said liquid crystal layer to be locally polarized in a corresponding pattern thereby changing the optical properties of said liquid crystal layer in a pattern corresponding to said input image;
at least two transparent electrodes, one disposed on the side of said photosensor opposite said liquid crystal layer and one on the side of said liquid crystal layer opposite said photosensor; and
a voltage source for maintaining a bias voltage across said transparent electrodes.

4,622,655
SEMICONDUCTOR MEMORY

Shunichi Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 4, 1984, Ser. No. 607,026
Claims priority, application Japan, May 4, 1983, 58-78768
Int. Cl.[4] G11C *11/24*
U.S. Cl. 365—149 11 Claims

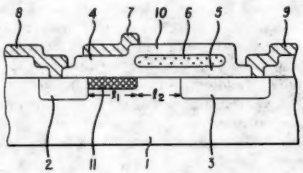


1. A semiconductor memory comprising:
(a) at least a pair of bit lines;
(b) a plurality of word lines and a pair of dummy word lines which cross said pair of bit lines;
(c) memory cells arranged in the vicinities of intersections between one of said pair of bit lines and said plurality of word lines, each of said memory cells including a transistor, a gate of which is connected to a corresponding one of said plurality of word lines, a first terminal of which is connected to a corresponding one of said pair of bit lines and a second terminal of which is connected to a capacitive element, and each of said memory cells being arranged to store one of first and second voltage states in response to a write signal;
(d) a pair of dummy cells respectively coupled to said pair of bit lines and said pair of dummy word lines, each of said dummy cells having substantially the same construction as each of said memory cells and including a transistor and a capacitive element, the capacitive element of each of said dummy cells being adapted to be connected to only one of said pair of bit lines;
(e) means coupled to said pair of dummy word lines for rendering said transistors of said pair of dummy cells conducting;
(f) means for connecting said pair of bit lines to each other at a predetermined timing when both of the transistors in said pair of dummy cells are conducting, to thereby set said pair of bit lines at a third voltage state said third voltage state being an intermediate potential value between said first and second voltage states;
(g) means, responsive to an address signal, for connecting a capacitive element in a selected one of said memory cells to one of said pair of bit lines by means of a selected one of said word lines and disconnecting said capacitive element in one of said dummy cells from that one of said pair of bit lines, while maintaining the connection between said capacitive element in the other dummy cell and the other of said pair of bit lines; and
(h) means for differentially detecting signals on said pair of bit lines.

4,622,656
NON-VOLATILE SEMICONDUCTOR MEMORY

Masaaki Kamiya, and Yoshikazu Kojima, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,728
Claims priority, application Japan, Dec. 16, 1982, 57-220838
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 27 Claims



1. A non-volatile semiconductor memory comprising:
a first conductivity-type semiconductor region;
a second conductivity-type source and drain regions formed on said first conductivity-type semiconductor region and separated from each other by a certain distance;
a first channel region formed between said source region and said drain region and being in contact with said source region;
a second channel region formed between said first channel region and said drain region;
a first gate insulating film formed on said first channel region;

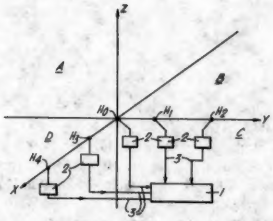
a second gate insulating film formed on said second channel region;
a first gate electrode formed on said first gate insulating film;
and a floating gate electrode formed on said second gate insulating film;
wherein said semiconductor region has a first conductivity-type impurity density in the proximity of said first channel region which is sufficiently higher than the impurity density in the proximity of said second channel region to accelerate part of the channel current electrons and inject them into said floating gate electrode at a location where said first channel region is in contact with said second channel region.

4,622,657

ACOUSTIC DIRECTION FINDING SYSTEMS

Colin P. Clare, Buckinghamshire, England, assignor to McMichael Limited, England

Filed Mar. 28, 1984, Ser. No. 594,340
Int. Cl.⁴ G01S *3/80*
U.S. Cl. 367—129 **8 Claims**



4. An acoustic finding system comprising an array of at last five electro-acoustic transducers disposed in two groups each having three transducers, one of which may be common to both groups, along two orthogonal lines in a plane, a ratio of spacings between different pairs of transducers in each of the two groups being non-integral, and means responsive to periods between instants of zero-crossing of waves detected by two transducers of each of several said different pairs of transducers in the two groups, after allowance for the fact that said period may be determined by transducers responsive to different zero-crossings, for determining the quadrant in said plane emanating from the array in which lies the source of waves impinging thereon.

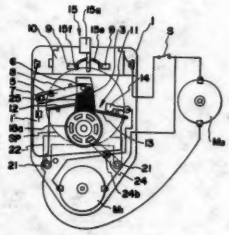
4,622,658

SIMPLIFIED SOUND REPRODUCING DEVICE HAVING SWITCHABLE CIRCUITS

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Japan

Filed May 13, 1983, Ser. No. 494,421
Claims priority, application Japan, Jan. 27, 1983, 58-11729
Int. Cl.⁴ G11B *31/00, 3/00*
U.S. Cl. 369—31 **2 Claims**

1. An improved simplified sound reproducing device for use in or with a doll, toy or the like comprising:
a casing;
a record disc housed in the casing and having at least one recorded groove formed thereon with starting and end points of sound reproduction;
first motor for rotating the record disc;
a tone arm adapted to travel from the starting point to the end point of sound reproduction along the recorded groove of the record disc;
return spring means for biasing the tone arm to the starting point of sound reproduction on the recorded groove;
a pickup mounted on the tone arm;
a speaker unit including a speaker and a sound transmitting member, the speaker unit being slidably engaged by the pickup;
a second motor for driving the doll, toy or the like;
a power source;
a switching circuit including:
a first movable contact mounted in the casing apart and distinct from the tone arm and pickup, the first movable contact extending to the end point of sound reproduction on the recorded groove on the record disc in the swing plane of the pickup, the first movable contact being movable between a first normal position and a second position upon pivotal engagement by the tone arm;
a fixed contact mounted in the casing; and
a second movable contact mounted in the casing and movable between a first normal position contacting the fixed contact and a second position out of contact with the fixed



contact and contacting the first contact when the first movable contact is engaged by the tone arm and pickup;
the second movable contact when contacting the fixed contact completes a first electrical circuit between the power source, the first motor, the second movable contact and the fixed contact for driving the first motor to rotate the record disc; and where
the pickup engages the first movable contact when it reaches the end point of sound reproduction on the recorded groove of the record disc and urges the first movable contact to the second position engaging the second movable contact and urging the second movable contact to its second position out of contact with the fixed contact to complete a second electrical circuit between the power source, the second motor, the first movable contact and the second movable contact to energize the second motor for driving the doll, toy or the like.

4,622,659

FOCUS DETECTION AND CONTROL APPARATUS FOR MAINTAINING ACCURATE FOCUSING IN AN OPTICAL MEMORY SYSTEM BY DETECTING REFLECTED BEAM DIAMETER VARIATIONS AT SPACED PREDETERMINED LOCATIONS

Robert L. Hazel, Thousand Oaks, and Gilbert Y. Chan, Agoura, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 9, 1982, Ser. No. 416,419
The portion of this patent subsequent to Dec. 17, 2002, has been disclaimed.
Int. Cl.⁴ G11B *7/00, 21/10*
U.S. Cl. 369—45 **10 Claims**

1. Apparatus useful for detecting the quality of focusing of an incident radiation beam directed to an optical storage medium, said apparatus comprising:
focus detection means; and
means responsive to the reflected beam from said medium for directing a focus detection beam to said focus detection means which will be parallel when said incident beam is in focus on said medium, diverging when said incident beam is out of focus in a first direction, and converging

when said incident beam is out of focus in the opposite direction;

said focus detection means including means for separating said focus detection beam into first and second beams;

said focus detection means also including a first optical detector to which said first beam is directed and a second optical detector to which said second beam is directed, each detector being adapted to intercept a respective prescribed peripheral portion of the beam directed thereto and to provide an electrical output signal in response thereto;

said focus detection means further including circuit means to which the outputs of said detectors are applied for producing a focus error signal indicating said quality of focusing and having a value dependent on the relative values of the detector outputs applied to said circuit means;

said detectors being located at different optical distances which are chosen in conjunction with said peripheral portions so that: (1) when said focus detection beam is diverging said first detector receives a wider beam and said second detector receives a narrower beam than when said focus detection beam is parallel, resulting in said first detector intercepting a greater portion and said second detector intercepting a smaller portion than when said focus detection beam is parallel, and (2) when said focus detection beam is converging said first detector receives a narrower beam and said second detector a wider beam than when said focus detection beam is parallel, resulting in said first detector intercepting a smaller portion and said second detector intercepting a greater portion than when said focus detection beam is parallel.

4,622,660

SYSTEMS AND METHODS FOR SIGNAL COMPENSATION

Kenneth W. Cowans, 17520 Greenleaf St., Encino, Calif. 91316, and M. Owen Bennett, 5913 Etiwanda Ave. #7, Tarzana, Calif. 91356

Continuation of Ser. No. 467,434, Feb. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 435,778, Oct. 21, 1982, abandoned. This application Dec. 10, 1985, Ser. No. 808,211

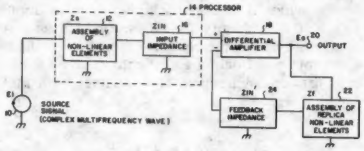
Int. Cl.[4] G11B *3/00*

U.S. Cl. 369—134 **30 Claims**

1. A system for compensating for substantially immeasurable signal deviations introduced in a complex multifrequency waveform by a unit including electrical devices having internal signal dependent nonlinearities that introduce second order deviations, the system operating independently of phase and frequency properties of the waveform and comprising:

high gain amplifier means coupled to receive the complex multifrequency waveform and providing an output signal responsive thereto; and

signal modifying means including passive replica means in the form of electrical device which replicate the signal dependent nonlinearities introduced by at least one of the electrical dependent nonlinearities introduced by at least one of the electrical devices of the unit and coupled to receive the output signal to introduce corresponding immeasurable signal dependent nonlinearities therein, the



thus-modified signal being coupled to the amplifier means in a sense and amplitude to compensate the signal deviations arising from the nonlinearities of the unit electrical devices in the output signal of the amplifier means without modifying phase or frequency characteristics of the complex multifrequency waveform.

4,622,661

OPTICALLY READABLE STORAGE DISC

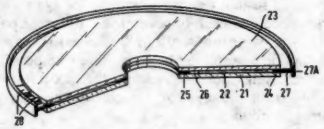
Leonardus P. J. Hoogeveen; Hendrikus W. C. M. Peeters, and Aloysius M. J. M. Spruijt, all of Eindhoven, Netherlands, assignors to Optical Storage International Holland, Eindhoven, Netherlands

Continuation-in-part of Ser. No. 617,006, Jun. 4, 1984, abandoned. This application Feb. 11, 1985, Ser. No. 700,233

Claims priority, application Netherlands, Feb. 14, 1984, 8400477

Int. Cl.[4] G11B *7/00, 3/70, 5/82, 25/04*

U.S. Cl. 369—280 **12 Claims**



1. In an interchangeable optically readable storage disc comprising

a flat transparent substrate having flat sides and a circular periphery,

a recording layer adapted to be locally modified by a radiation beam, said recording layer being on one of said flat sides of said substrate,

a cover means secured to said flat side of said substrate adjacent the circumference thereof in an annular region spaced radially from at least that part of said recording layer to be recorded, whereby a space is provided between said cover and substrate at the circumference of said recording layer, said cover means defining a protective circumferential portion thereof having an outer edge portion with an external diameter larger than that of the circumference of said layer;

the improvement wherein said protective circumferential portion comprises balancing means for correcting eccentric positioning of the mass center of said disc, said balancing means comprising annular means extending radially outward of the periphery of said substrate and having locally and selectively removed portions.

4,622,662
WAVELENGTH-SELECTIVE MULTIPLEXER-DEMULTIPLEXER

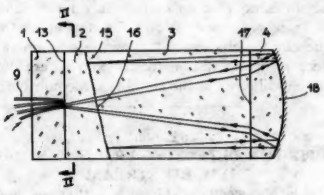
Jean-Pierre Laude, Saclas; Jean Flamand, Chatenay-Malabry; Gérard Pitois, Arpajon, and Didier Lepére, Sevres, all of France, assignors to Instruments S.A., France

Filed Apr. 2, 1984, Ser. No. 595,739

Claims priority, application France, Mar. 31, 1984, 83 05364

Int. Cl.[4] H04B 9/00

U.S. Cl. 370—3 **19 Claims**



1. A multiplexer-demultiplexer of the type wherein light of different wavelengths to be mixed or separated is carried by optical transmission fibers, the ends of which are disposed in the immediate vicinity of the focus of a concave mirror associated with a diffraction grating, comprising four transparent elements that are glued one to the other successively:

(a) a fiber-carrying element in which the input and output fibers are embedded with their ends flush with the plane contact surface of the following element;

(b) a grating-carrying element having a plane face for contact with said fiber-carrying element and an opposing plane face on which is formed the diffraction grating except for a zone located within the exit and entry cones of the fibers;

(c) an intermediate element having the same index of refraction as the grating-carrying element; and

(d) a mirror element with a plane face for contact with the intermediate element and an opposing spherical face treated to constitute a spherical mirror facing the intermediate element and the grating, said mirror element having an index of refraction different from that of the intermediate element and having a refractive index which compensates for longitudinal spherical aberration for at least one of the incident wavelengths being utilized.

4,622,663
OPTICAL WAVELENGTH DEMULTIPLEXER

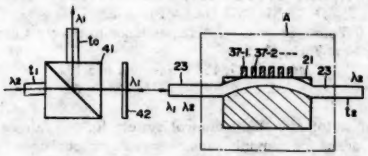
Haruo Ishikawa, Oume, and Yoshimasa Fujii, Tokyo, both of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,110

Claims priority, application Japan, Jan. 25, 1984, 59-12692

Int. Cl.[4] H04B 9/00

U.S. Cl. 370—3 **4 Claims**



1. An optical wavelength demultiplexer which comprises

a first substrate which has a top surface and an elongated groove extending therein from said top surface, said elongated groove having a floor which is convexly curved in the elongated dimension of said groove, the shallowest depth of said convexly curved floor in said first substrate being less than a distance r,

a single-mode optical fiber having a radius r positioned in said elongated groove in said first substrate, said optical fiber including an inner core and an outer cladding, a portion of said outer cladding which would otherwise extend above said top surface of said first substrate being removed to provide a generally flat, mirror-polished surface, said generally flat, mirror-polished surface being near said inner core of said single-mode optical fiber, said optical fiber being capable of carrying light having differing wavelengths therethrough, and

a diffraction grating in direct contact with said generally flat, mirror-polished surface of said outer cladding of said optical fiber so as to separate a portion of the light that is passing through said optical fiber and reflect said light portion back into said optical fiber in the direction from which it came, said light portion comprising of certain wavelengths, said diffraction grating having a pitch of $\lambda/2n_f$ where λ is the wavelength light to be separated and n_f the effective refractive index of said optical fiber, said diffraction grating being oriented with respect to said optical fiber that the direction of its pitch is coincident with the elongation direction of said groove.

4,622,664
CHANNEL CONTROL SYSTEM FOR LOOP TYPE SIGNAL TRANSMISSION CHANNEL

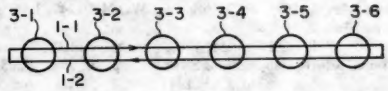
Ken Itoh, Tokyo; Koichi Tokura, Kanagawa, and Shigeyuki Fukada, Tokyo, all of Japan, assignors to Japanese National Railways, Tokyo, Japan

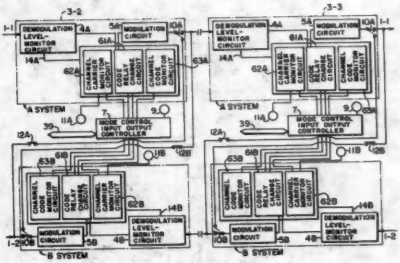
Filed Oct. 2, 1984, Ser. No. 657,017

Claims priority, application Japan, Oct. 19, 1983, 58-194403; Oct. 26, 1983, 58-199247

Int. Cl.[4] H04J 3/00, 1/16, 3/14

U.S. Cl. 370—86 **3 Claims**





1. A loop type signal transmission channel control system comprising a plurality of information transmission posts which are linked up in a loop channel and arranged such that a channel idle code indicating a channel idle condition is normally circulated in the channel, each post regenerating and relaying said code; each post having a transmitting means arranged such that a post which must transmit information to other posts transmits such information to other posts after converting said channel idle code to a channel code indicating a channel busy condition under an assumption that a channel idle code was

previously in circulation and, after said post has delivered said information, said post again delivers a channel idle code to the channel, whereby an assignment of the transmitting right is made between different posts; said system further comprising a means such that a post with the shortest detection time for the detection of an absence of a channel code in the loop initially delivers the channel idle code and delivers said channel idle code after an absence of a channel code wherein each post, which operates in either direction of one loop comprises: an A-system for operating in one loop direction and a B-system for operating in the other loop direction and a mode switch circuit for switching between a relay mode for coupling said post so as to relay a signal and a terminal mode for coupling said post so as to separate its A-system from its B-system for turning back a signal; each of said A and B systems comprising a circuit for detecting a channel carrier signal OFF and a circuit for generating a carrier ON-OFF signal and a circuit for detecting an approach and circulation of a channel code; wherein a post which has detected a channel carrier signal OFF switches itself into a terminal mode by its mode switch circuit and returns a carrier ON-OFF signal and a post which has detected the carrier ON-OFF signal switches itself into a terminal mode while continuing to output a second carrier ON-OFF signal, and wherein, when a channel carrier signal OFF occurs, a part of a loop including the source of the channel carrier signal OFF and a part of loop not including the source of the channel carrier signal OFF are distinguished and when a post in a terminal mode determines from its approach and circulation detect circuit that a channel code has circulated to both loops of the terminal post, then said post switches itself to a relay mode by its mode switch circuit and said two parts of the loop are merged again when the channel carrier signal OFF vanishes.

4,622,665

SYNCHRONIZING SYSTEM

Stig R. E. Jönsson, Stockholm, and Lars-Erik A. Larsson, Norsborg, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

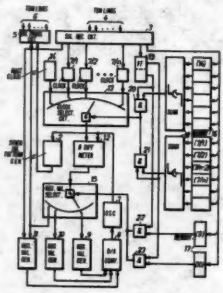
PCT No. PCT/SE83/00327, § 371 Date May 4, 1984, § 102(e) Date May 4, 1984, PCT Pub. No. WO84/01247, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 14, 1983, Ser. No. 610,292

Claims priority, application Sweden, Sep. 20, 1982, 8205365

Int. Cl.⁴ H04J *3/06*

U.S. Cl. 370—100 **2 Claims**



1. A system comprising a plurality of stored program controlled digital telecommunication stations adapted for being synchronized and including program memory means, time-division-multiplex (TDM) links means for synchronizing said stations, each of said station including an oscillator including a frequency regulation input for generating a transmission pulse swinging about a normal clock pulse, a plurality of clocks for generating bit pulses and to which information is transferred from the associated TDM links means, a phase difference meter for determining phase differences between the oscillator transmission pulse and the bit pulses of the clocks, a regulation value generator for converting said phase differences to values for regulating the oscillator frequency, a clock selector including inputs connected to the clocks and an output connected to the phase difference meter, regulation value generators which individually convert determined clock pulse phase differences to regulation values which are sent to said frequency regulation input of said oscillator, and a regulation value generator selector for activating one of said generators, the program memory means of the stations including reprogrammable selection memories coupled to said clock selector and to said regulation value generator selector for storing control information whereby the clock selectors and regulation value generator selectors of the stations of the system are controlled such that the oscillators of the stations are synchronized.

4,622,666

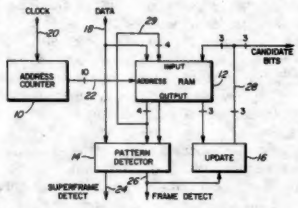
CIRCUITS FOR DETECTING FRAMING BITS IN A T.D.M. BIT STREAM

Alan F. Graves, Sherwood Park; Paul A. Littlewood, and Johannes S. Weiss, both of Edmonton, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 10, 1984, Ser. No. 680,436

Int. Cl.⁴ H04J *3/06*

U.S. Cl. 370—100 **14 Claims**



1. A framing circuit for detecting framing bits in a predetermined framing bit pattern in a time channel of a t.d.m. bit stream, comprising:

a RAM for storing in respect of each time channel a plurality of most recent information bits of the time channel and one or more other bits;

means for detecting the framing bit pattern in the current and stored information bits of each time channel;

means for modifying said other bits for the respective time channel in dependence upon such detection; and

means for producing a framing signal in dependence upon said other bits.

4,622,667

DIGITAL FAIL OPERATIONAL AUTOMATIC FLIGHT CONTROL SYSTEM UTILIZING REDUNDANT DISSIMILAR DATA PROCESSING

Larry J. Yount, Scottsdale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 27, 1984, Ser. No. 675,154

Int. Cl.⁴ G06F *11/16, 15/16*

U.S. Cl. 371—9 **24 Claims**

1. An automatic flight control system for aircraft having sensor means for providing sensor signals in accordance with flight conditions experienced by said aircraft and having aircraft control means responsive to control signals for controlling the flight conditions of said aircraft, said system comprising

at least first and second automatic flight control subsystems, said first subsystem including first and second automatic flight control system channels and said second subsystem

including third and fourth automatic flight control system channels,

said first, second, third and fourth automatic flight control system channels receiving said sensor signals and providing said control signals,

a first digital data processing computer included in said first channel,

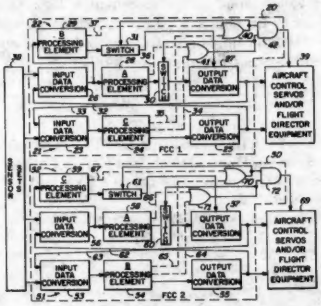
second and third digital data processing computers included in said second channel,

first cross channel monitoring means for comparing the output of said first computer with the outputs of said second and third computers and providing first and second comparison signals in accordance with disagreement therebetween, respectively,

first disabling means responsive to said first comparison signal for disabling said second computer when said first comparison signal indicates disagreement between the outputs of said first and second computers,

second disabling means responsive to said second comparison signal for disabling said third computer when said second comparison signal indicates disagreement between the outputs of said first and third computers,

third disabling means responsive to said first and second comparison signals for disabling said first automatic flight control subsystem when said first and second comparison signals indicate disagreement between the outputs of said first and second computers and between the outputs of said first and third computers, respectively,



a fourth digital data processing computer included in said third channel,

fifth and sixth digital data processing computers included in said fourth channel,

second cross channel monitoring means for comparing the output of said fourth computer with the outputs of said fifth and sixth computers and providing third and fourth comparison signals in accordance with disagreement therebetween, respectively,

fourth disabling means responsive to said third comparison signal for disabling said fifth computer when said third comparison signal indicates disagreement between the outputs of said fourth and fifth computers,

fifth disabling means responsive to said fourth comparison signal for disabling said sixth computer when said fourth comparison signal indicates disagreement between the outputs of said fourth and sixth computers, and

sixth disabling means responsive to said third and fourth comparison signals for disabling said second automatic flight control subsystem when said third and fourth comparison signals indicate disagreement between the outputs of said fourth and fifth computers and the outputs of said fourth and sixth computers, respectively,

said first, second, third, fourth, fifth and sixth computers performing identical tasks with respect to each other for providing said control signals in response to said sensor signals,

said first, second and third computers providing dissimilar data processing with respect to each other,

said fourth, fifth and sixth computers providing dissimilar data processing with respect to each other,

said first and fourth computers providing dissimilar data processing with respect to each other,

each of said first, second, third, fourth, fifth and sixth computers being selected from a group consisting of three computers that provide dissimilar data processing with respect to each other,

whereby said automatic flight control system is fail-operational with respect to a first generic fault.

4,622,668

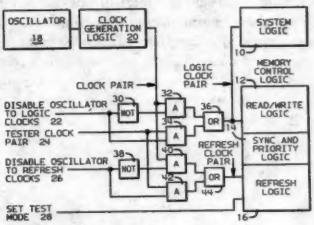
PROCESS AND APPARATUS FOR TESTING A MICROPROCESSOR AND DYNAMIC RAM

Gregory A. Dancker, Rochester, and Edwin C. Grazier, Stewartville, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 9, 1984, Ser. No. 608,655

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—20 **14 Claims**



1. Test system for a dynamic RAM and microprocessor including memory control logic, said test system comprising:

a. refresh means for refreshing a dynamic RAM, said refreshing means including separate independent clocks;

b. control means for controlling readwrite cycles in said dynamic RAM while said refresh means controls refresh cycles; and,

c. synchronization means and priority means for synchronizing stimulus to said separate independent clocks and insuring priority of said controlling means over said refresh means whereby said dynamic RAM appears static.

4,622,669

TEST MODULE FOR ASYNCHRONOUS BUS

Shlomo Pri-Tal, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 464,305, Feb. 7, 1983, abandoned. This application Mar. 4, 1985, Ser. No. 708,093

Int. Cl.[4] G01R *31/28*

U.S. Cl. 371—25 **6 Claims**

1. A test module for diagnosing an asynchronous microprocessor bus, said asynchronous microprocessor bus having a plurality of signal lines, and a microprocessor under test coupled to said asynchronous bus, comprising:

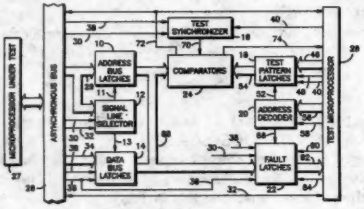
a test microprocessor having a plurality of test patterns;

first means coupled to said test microprocessor for sequentially latching said test patterns;

second means coupled to said asynchronous bus for sequentially latching the state of said plurality of signal lines as a bit pattern;

third means coupled to said asynchronous bus, said test microprocessor, said first means, and said second means, for comparing one of said bit patterns to one of said test patterns wherein a continue signal is supplied to said asynchronous bus and said test microprocessor when said

test pattern and said bit pattern are the same, said continue signal causing said test microprocessor to supply another of said test patterns and said microprocessor under test to supply another of said bit patterns for comparison, and wherein a diagnose signal is supplied to said test microprocessor when said test pattern and said bit pattern are not the same; and



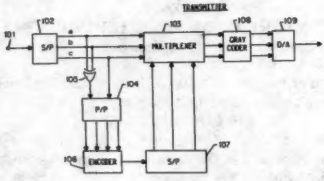
fourth means coupled to said second means and said test microprocessor for transmitting said bit pattern from said second means to said test microprocessor when said diagnose signal is generated, whereby in absence of said continue signal said microprocessor under test maintains said diagnose signal causing the state of said bit pattern within said asynchronous bus, and said diagnose signal causes said test microprocessor to diagnose said bit pattern and provide an output.

4,622,670

ERROR-CORRECTION CODING FOR MULTILEVEL TRANSMISSION SYSTEM

Gary D. Martin, North Andover, Mass., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 10, 1984, Ser. No. 680,000
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—43 **36 Claims**



1. A multilevel modulated signal transmitter of the type including an encoder for generating error-correction check bits and means for multiplexing said error-correction check bits with information bits for transmission, wherein the improvement comprises,

means for converting information bits of information bit symbols to be transmitted into corresponding error-correction bit symbols each having fewer bits than a corresponding one of said information bit symbols, and

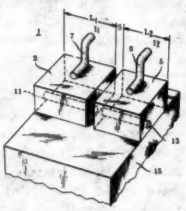
means for supplying said error-correction bit symbols to said encoder.

4,622,671

MULTICAVITY OPTICAL DEVICE

Won-Tien Tsang, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 469,891, Feb. 25, 1983, abandoned. This application Apr. 8, 1983, Ser. No. 482,964
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—19 **32 Claims**



1. A device comprising:

a first semiconductor laser diode section, said section having a first active layer;

a second semiconductor laser diode section, said section having a second active layer, said first and second active layers having a width less than approximately 20 μm;

said first and second sections being optically coupled in both directions through spaced cleaved surfaces; and

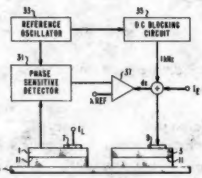
means for adjusting the refractive index of said first and second sections relative to each other.

4,622,672

SELF-STABILIZED SEMICONDUCTOR LASERS

Larry A. Coldren, Holmdel, N.J., and Karl J. Ebeling, Gleichen, Fed. Rep. of Germany, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 20, 1984, Ser. No. 572,682
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—32 **12 Claims**



1. A wavelength-stabilized semiconductor laser comprising a laser cavity, a second cavity, said laser cavity and said second cavity being optically coupled to each other, means for measuring a voltage variation across the laser cavity, means for comparing the measured voltage to a reference characteristic, and means for varying a property of said second cavity by an amount determined by said comparing step.

4,622,673

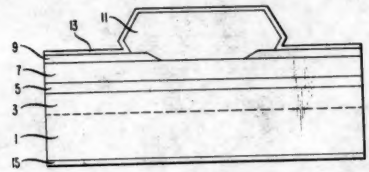
HETEROEPITAXIAL RIDGE OVERGROWN LASER

Won-Tien Tsang, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 24, 1984, Ser. No. 613,469
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **12 Claims**

1. A semiconductor laser, in sequence a first semiconductor cladding layer; a semiconductor active layer; a second semi-

conductor cladding layer; a dielectric layer said dielectric layer having a stripe opening exposing said second cladding



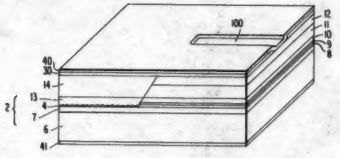
layer; a semiconductor ridge in said opening; and contacts to said ridge and first cladding layer.

4,622,674

SINGLE LONGITUDINAL MODE SEMICONDUCTOR LASER

Ikuo Mito, Tokyo, Japan, assignor to NEC, Tokyo, Japan

Filed May 7, 1984, Ser. No. 608,045
Claims priority, application Japan, May 9, 1983, 58-80378
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **16 Claims**



1. A semiconductor laser diode comprising:
a substrate;
an optical waveguide, sandwiched between first and second cladding regions and formed over a first portion of the substrate, for feeding back radiation propagating therethrough, the optical waveguide having a corrugated region extending within the optical waveguide in a direction parallel to the surface of the substrate, the thickness of the corrugated region varying in a prescribed period and the refractive index of the corrugated region differing from that of said optical waveguide;
an optically active layer defined by opposite flat boundaries, butt-jointed to said optical waveguide and formed over a second portion of said substrate, for emitting radiation when a current is injected into it; and
a pair of electrodes for supplying an injection current to said optically active layer.

4,622,675

FORCED TRANSPORT MOLECULAR GAS LASER AND METHOD

Wayne M. Penn, Cartersville, Ga., assignor to P.R.C., Ltd., Kennesaw, Ga.

Filed Jul. 29, 1983, Ser. No. 518,700
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—58 **31 Claims**

1. A forced transport, electrically excited molecular gas laser having a large volume discharge in a gaseous medium at a pressure of at least 50 Torr comprising a resonant optical cavity with means defining an at least essentially unobstructed flow path for a gaseous lasing medium flowing to and through said resonant optic cavity, gaseous lasing medium having a pressure of at least 50 Torr contained in said flow path, means for moving said gaseous lasing medium at high speed along said flow path, means for electrically exciting the moving gaseous medium along an active discharge length of said flow path to create a plasma for lasing, means for abstracting energy from said cavity, and wherein said means defining the flow path includes an at least essentially unobstructed expansion

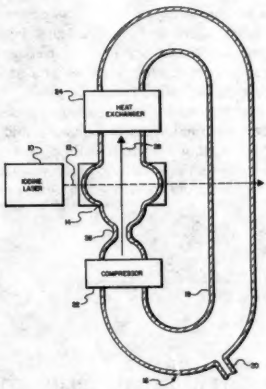
chamber in the vicinity of the active discharge length of said flow path for rapidly expanding said moving gaseous lasing medium to stir said plasma and provide a uniform and stable discharge.

4,622,676

UPCONVERSION OF LASER RADIATION FREQUENCY IN AN OXYGEN-IODINE LASER

David J. Benard, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 23, 1985, Ser. No. 693,952
Int. Cl.[4] H01S *3/095*
U.S. Cl. 372—70 **8 Claims**



1. A method for converting infrared laser, radiation to visible laser radiation comprising the steps of:
injecting a mixture of iodine, oxygen and fluorine gases into a laser cavity; and
passing infrared laser radiation having a wavelength of 1315 nm through the gases in said cavity to excite molecules therein and cause reactions among the molecules resulting in the production of excited IF**(B) molecules which release their excitation energy to produce visible laser radiation.

4,622,677

METHOD AND DEVICE FOR CLAMPING THE ELECTRODE CONTACT SHOES AROUND THE ELECTRODE OF AN ELECTRIC FURNACE

Heikki Tuovinen, Ulvila; Kauko K. Rinne, Noormarkku; Matti Honkaniemi, Tornio; Risto M. Heikkilä, Haaparanta, and Martti Jankkila, Kiviranta, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

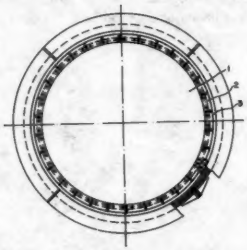
PCT No. PCT/FI82/00020, § 371 Date Jan. 13, 1983, § 102(e) Date Jan. 13, 1983, PCT Pub. No. WO82/04372, PCT Pub. Date Dec. 9, 1982

PCT Filed May 28, 1982, Ser. No. 459,528

Claims priority, application Finland, May 12, 1982, 811649

Int. Cl.[4] H05B *7/10*

U.S. Cl. 373—101 5 Claims



1. A device for clamping and cooling electrode contact shoes mounted with gaps therebetween around the electrode of an electric furnace, comprising

(a) at least one continuous hydraulic pressure element adapted for circulating a hydraulic fluid, substantially surrounding and contacting all of the contact shoes, the contact shoes being at least fifteen in number, closely spaced and substantially completely surrounding the electrode,

(b) at least one sealing spring mounted between each pair of adjacent contact shoes to seal the gaps between the contact shoes to substantially prevent passage therebetween of gases from the electric furnace and thereby isolate said pressure element from said gases,

(c) a rigid support structure surrounding, supporting and contacting said hydraulic pressure element, and

(d) means for circulating a hydraulic fluid in the pressure element to produce an essentially uniform inward hydraulic pressure to clamp the contact shoes tightly around the electrode.

4,622,678

ELECTRICALLY HEATED FOREHEARTH

Frederick Scarfe, Benfleet, United Kingdom, assignor to Electroglass Limited, United Kingdom

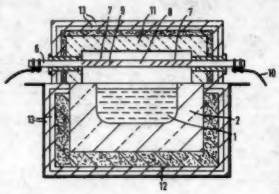
Filed Jun. 27, 1985, Ser. No. 749,445

Claims priority, application United Kingdom, Jul. 5, 1984, 8417117; Apr. 2, 1985, 8508566

Int. Cl.[4] C03B *18/18*

U.S. Cl. 373—134 6 Claims

1. A forehearth having a molten liquid delivery channel with disposed thereover (a) a channel ceiling member of insulating refractory ceramic fibre material and (b) a plurality of electrical heating elements arranged transverse to the flow direction of the molten liquid in said channel, the cross-sectional area of the electrical path in at least one of said elements being reduced on either side of a central portion of said element whereby to



provide a greater heating effect from said element towards the sides than towards the centre of said delivery channel.

4,622,679

CORELESS INDUCTION FURNACE

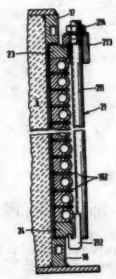
Lorenz Voss, Monschau, Fed. Rep. of Germany, assignor to Otto Junker GmbH, Simmerath, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,629

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1984, 3405120

Int. Cl.[4] H05B *5/16*

U.S. Cl. 373—152 22 Claims



1. A coreless induction furnace for melting, heating or treating metals or metal melts, particularly in vacuum or under high pressure, comprising a crucible, and a cooled induction coil including a plurality of windings, a plurality of spacer means positioned between individual windings and a plurality of intermediate layers also positioned between said windings and formed of resilient gas-tight material, said intermediate layers being each positioned laterally adjacent a respective spacer means between individual windings so that each intermediate layer is closer to a central axis of said coil while said spacer means each extends to a peripheral edge of said coil, said windings together with said intermediate layers forming a portion of an outer gas-tight jacket surrounding said crucible, and a clamping device compressing said windings and said resilient intermediate layers together in an axial direction of the induction coil so that gas-tight material of said intermediate layers between said windings is compressed.

4,622,680

HYBRID SUBBAND CODER/DECODER METHOD AND APPARATUS

Richard L. Zinser, Schenectady, N.Y., assignor to General Electric Company, Lynchburg, Va.

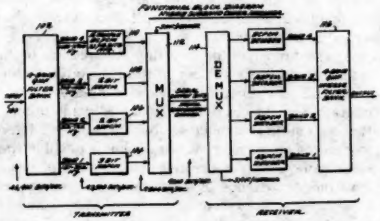
Filed Oct. 17, 1984, Ser. No. 661,598

Int. Cl.[4] G10L *1/06*

U.S. Cl. 375—25 18 Claims

10. In a subband signal processing method for processing an input electrical signal having a frequency band of signal com-

ponents by separating it into plural frequency subbands of signal components which subbands are separately encoded into corresponding binary-valued digital signals that are subsequently combined for transmission over a common digital communication channel, the improvement comprising:



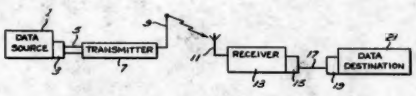
encoding the signal components at least one of said subbands in accordance with a backward adaptive encoding algorithm and encoding the signal components of at least one other of said subbands in accordance with a forward adaptive encoding algorithm.

4,622,681

APPARATUS FOR TRANSMITTING DIGITAL DATA

Stephen C. Snell, Watsonville, and Thomas P. Scarinci, Aptos, both of Calif., assignors to Empath Communications, Inc., Aptos, Calif.

Filed Apr. 26, 1984, Ser. No. 604,065
Int. Cl.[4] H04B *9/00*; H04L *22/10*
U.S. Cl. 375—48 **6 Claims**



1. An apparatus connectable to an electrical signal output of a source of digital data for transmitting said digital data on a frequency modulated radio signal, comprising:

an interface adapter electrically connectable to said electrical signal output which converts binary digital data on said electrical signal output having first and second electrical logic levels to an optical signal having a first light intensity corresponding to said first electrical logic level and having a second light intensity corresponding to said second electrical logic level; and

a radio transmitter, optically connected to said interface adapter, which receives said optical signal and generates a frequency modulated signal in response to said optical signal, said frequency modulated signal generated at first and second frequencies when said optical signal has said first light intensity and generated at third and fourth frequencies when said optical signal has said second light intensity, said first and second frequencies symmetrical about a selected center frequency and said third and fourth frequencies symmetrical about said selected center frequency;

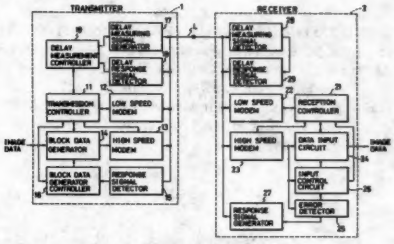
wherein said transmitter has no electrical connection to said interface adapter.

4,622,682

ARQ TRANSMISSION SYSTEM

Kazumasa Kumakura, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Mar. 26, 1984, Ser. No. 593,603
Claims priority, application Japan, Mar. 25, 1983, 58-48726
Int. Cl.[4] H04L *1//16*
U.S. Cl. 375—58 **6 Claims**



1. A communication system having an ARQ function for transmitting data between a transmitter and a receiver in which said receiver supplies a response signal to said transmitter every time said receiver receives a block of data having a predetermined number of bits from said transmitter, said system comprising:

delay measuring means for measuring a time delay in transmitting a signal between said transmitter and said receiver through a selected transmission route;

means for generating and transmitting said block of data to be transmitted from said transmitter to said receiver; and

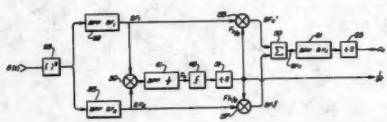
controlling means responsive to said time delay measured by said delay measuring means for controlling said means for generating and transmitting such that said number of bits of said block of data is varyingly set in accordance with said time delay measured by said delay measuring means wherein said response signal from said receiver is different in frequency from said data transmitted by said transmitter.

4,622,683

FAST ACQUISITION RINGING FILTER MSK DEMODULATOR

Jack K. Basham, Westchester; Kenton T. T. Ho, Torrance, and Eric M. Mrozek, Manhattan Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 8, 1984, Ser. No. 670,440
Int. Cl.[4] H04L *27/14*
U.S. Cl. 375—90 **16 Claims**



12. For use in a minimum shift keying (MSK) receiver system, a method for recovering clock and carrier signals from a received signal containing two frequency tones F_1 and F_2, said method comprising the steps of:

doubling the frequency of the received signal;

applying the frequency-doubled signal to first and second ringing filters tuned to frequencies $2F_1$ and $2F_2$, respectively, to yield first and second continuous signals at frequencies $2F_1$ and $2F_2$, but amplitude modulated in complementary senses in accordance with data signals encoded on the received signal; and

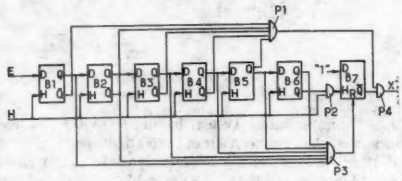
recovering a carrier signal from the first and second continuous signals, the recovered carrier signal being free of amplitude modulation, and wherein said recovering step includes deriving a clock signal from the first and second continuous signals, mixing the clock signal with the first and second continuous signals, to obtain intermediate signals at twice the carrier frequency, and summing the intermediate signals to eliminate amplitude modulation.

4,622,684

DEVICE FOR RECOGNITION OF BINARY WORDS

Jean-Louis V. Guichard, Paris, France, assignor to Societe Anonyme de Telecommunications, France

Filed Feb. 6, 1984, Ser. No. 577,037
Claims priority, application France, Feb. 8, 1983, 83 01920
Int. Cl.[4] H04L *7/00*; G08C *19/00*
U.S. Cl. 375—116 **5 Claims**



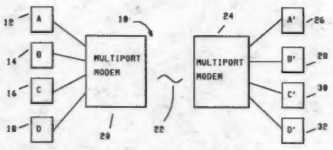
1. A device for recognition of a binary locking word in a digital train, which comprises means for identifying a first part of said locking word, means for confirming and memorizing this identification, means for identifying a second part of said locking word, said first and second parts of said locking word overlapping, means for erasing said memorization, and means for confirming, upon erasure of said memorization, the identification of the entirety of said locking word.

4,622,685

RTS/DCD SIMULATOR

Sadhu R. Dhawan, Miramar, and Jessie Chao, Miami, both of Fla., assignors to Racal Data Communications Inc., Miami, Fla.

Continuation of Ser. No. 363,203, Mar. 29, 1982, abandoned. This application May 30, 1985, Ser. No. 739,570
Int. Cl.[4] H04B *1/38*; H04L *23/00*
U.S. Cl. 375—121 **11 Claims**



1. In a remote data receiver/transmitter adapted for use with a local multiport data receiver/transmitter having a plurality of transmission ports, each adapted to be connected through a transmission link to the remote data receiver/transmitter, and adapted to be connected to a respective one of a plurality of first data terminals for communication of data from the respective one of the first data terminals to a respective one of a plurality of second data terminals, each connected to one of a plurality of transmission ports of the remote data receiver/transmitter, the improvement in means for maintaining RTS/DCD simulation unless actual data termination occurs, said improvement comprising:

means in said transmitter for transmitting a two-part code indicative of termination of actual data, said first part of said two-part code comprising a predetermined stream of binary 1's or 0's of a fixed and preselected number of binary bits, and the second part of said two-part code being a predetermined number of occurrences of a preselected code sequence;

means in said receiver for detecting the presence in the data, transmitted for assignment to the respective second data terminal, of a repetitive stream of binary 1's or 0's or operating sequences thereof which is less in number than the transmitted number of bits in said predetermined stream for affording protection against possible transmission errors, and for thereafter detecting the presence of at least one occurrence of a preselected coded sequence of bits within a preselected number of succeeding bits received, wherein said preselected number of succeeding bits includes a plurality of said preselected coded sequences of bits; and

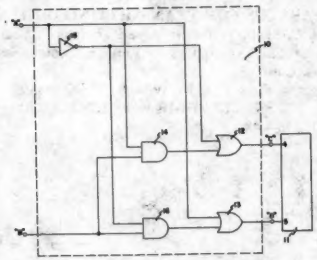
means in said receiver/transmitter responsive to said detection means upon detection of both parts of said two-part code for appropriately dropping the DCD/RTS signal.

4,622,686

UP/DOWN COUNTER INTERFACE MEANS

Robert S. Lundin, Northfield, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Oct. 19, 1984, Ser. No. 662,821
Int. Cl.[4] H03K *21/02*
U.S. Cl. 377—55 **1 Claim**



1. An up/down counter interface for converting input information suitable for operation of a first type of up/down counter, which type receives as a first input a direct current logic signal indicating direction and as a second input a train of electric pulses representing increments of information, to input information suitable for operation of a second type of up/down counter, which second type receives as a first input the aforesaid train of electric pulses and as a second input a train of electric pulses identical to the first input except displaced therefrom in time, with direction being determined by the second type of counter from the relative displacement in time of the first and second inputs, comprising:

(a) a first interface input connection to receive the direct current logic signal;

(b) a second interface input connection to receive the train of electric pulses;

(c) first and second interface output connections adaptable to be connected to an up/down counter of the second type;

(d) a first logic OR gate, the output of which is the first interface output;

(e) a second logic OR gate, the output of which is the second interface output and one input of which is the first interface input;

(f) a first logic AND gate, the output of which is one input

of the first logic OR gate, and the two inputs of which are the first and second interface inputs;

(g) a second logic AND gate, the output of which is one of the inputs of the second logic OR gate and one input of which is the second interface input; and

(h) an inverter, the input of which is the first interface input and the output of which is an input of the first logic OR gate and an input of the second logic AND gate;

wherein, when the direct current logic signal is at a high level, it will appear on the first interface output and the train of electric pulses will appear on the second interface output, and the up/down counter of the second type connected to the outputs will count the pulses in one direction; and when the direct current logic signal is at a low level, it will appear on the second interface output and the train of electric pulses will appear on the first interface output, and the up/down counter of the second type connected in the same manner to the outputs will count the electric pulses in the opposite direction.

4,622,687

LIQUID COOLED ANODE X-RAY TUBES

Stephen Whitaker, Davis, Calif., and Arthur H. Iversen, 15315 Sobey Rd., Saratoga, Calif. 95070, assignors to Arthur H. Iversen, Saratoga, Calif.

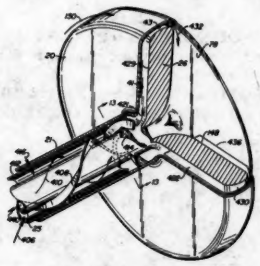
PCT No. PCT/US83/00204, § 371 Date Oct. 14, 1983, § 102(e) Date Oct. 14, 1983, PCT Pub. No. WO83/02850, PCT Pub. Date Aug. 18, 1983

Continuation-in-part of Ser. No. 348,785, Apr. 16, 1982, abandoned, and Ser. No. 250,275, Apr. 2, 1981, Pat. No. 4,405,876. This PCT application Feb. 16, 1983, Ser. No. 559,355

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.[4] H01J *35/10, 35/26*

U.S. Cl. 378—130 **50 Claims**



1. In an apparatus of the type including a rotatable hollow anode adapted for irradiation by an energy beam, and including a heat exchange surface, said apparatus including a stationary septum disposed within said hollow anode for defining a fluid conduit within said anode, means for providing a flow of coolant liquid in said conduit to remove heat from said heat exchange surface by formation of nucleate vapor bubbles on and removal from said heat exchange surface, and means, coupled to said anode within said fluid conduit for, responsive to rotation of said anode, increasing the rate of flow of said coolant liquid relative to said heat exchange surface; improvement wherein said apparatus further includes:

means, including curved surfaces disposed on said stationery septum to receive coolant liquid from said means for increasing rate of flow, for directing the flow of said liquid to traverse the path of anode rotation.

4,622,688

X-RAY TUBE COMPRISING TWO SUCCESSIVE LAYERS OF ANODE MATERIAL

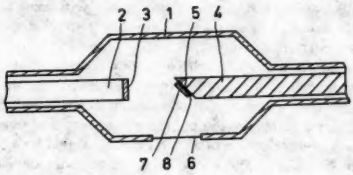
Willem H. Diemer, Eindhoven; John N. Kikkert, Almelo, and Hubertus F. M. Wagemans, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1984, Ser. No. 613,655

Claims priority, application Netherlands, May 25, 1983, 8301839

Int. Cl.[4] H01J *35/08*

U.S. Cl. 378—143 **13 Claims**



1. An X-ray tube comprising an anode target for emitting X-rays when struck by electrons, a cathode disposed opposite the anode target for emitting target striking electrons when an accelerating potential difference is applied between the cathode and the anode target, and an evacuated envelope containing the cathode and the anode target and having an X-ray permeable window for passing the X-rays emitted by the target;

characterized in that said anode target comprises, in order from the window:

(a) a first layer consisting essentially of a material having a maximum atomic number of approximately 30, for emitting long wavelength X-rays when a first predetermined accelerating potential difference is applied; and

(b) a second layer consisting essentially of a material having a minimum atomic number of approximately 40, for emitting short wavelength X-rays when a second predetermined accelerating potential difference is applied;

said first layer having a thickness which is sufficiently small to facilitate passage therethrough of X-rays emitted by the second layer.

4,622,689

STEREOPHONIC SOUND SYSTEM

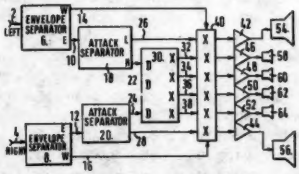
Gilbert L. Hobrough, 699 21st Ave., Vancouver, British Columbia, Canada V5Z 1Y9

Filed Feb. 1, 1985, Ser. No. 697,499

Claims priority, application United Kingdom, Feb. 1, 1984, 8402682

Int. Cl.[4] H04R *5/00*

U.S. Cl. 381—24 **8 Claims**



1. Apparatus for a stereophonic sound system comprising:

(i) a left channel input and a right channel input, respectively arranged to receive left and right audio signals produced by laterally separated left and right microphones;

(ii) for each channel, separator means connected to the input to separate the attack from the steady state portion of each

respective audio signal and produce an attack signal and a remainder or attackless signal;

(iii) comparator means connected to said left and right separator means, having a series of at least three output channels and arranged to receive and compare left and right attack signals to determine their arrival time difference and to generate and allocate resultant attack signals to particular output channels;

(iv) multiplier means connected to said left and right separator means and to said comparator means, having a series of outputs corresponding to said comparator output channels and arranged to receive said left and right attackless signals, multiply said attackless signals with said resultant attack signals and produce a combined attack audio signal at a corresponding output; and

(v) a lateral array of high frequency sound radiators each connected to a related output channel of said multiplier means, the allocation of a resultant attack signal to a particular channel by the comparator means and eventually to the reproduction of an attack audio signal by a particular radiator in the array being in accordance with the arrival time difference between the left attack signal and the right attack signal from a given input sound whereby the position of the particular radiator corresponds angularly to the azimuth position of the source of the input sound relative to the microphones.

4,622,690

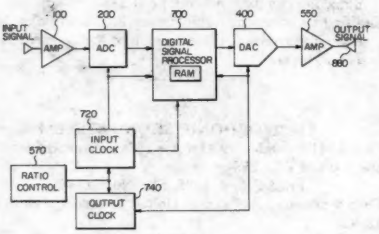
AUDIO FREQUENCY MULTIPLICATION DEVICE

Jay Smith, III, Pacific Palisades, and Gerald S. Karr, Venice, both of Calif., assignors to Smith Engineering, Culver City, Calif.

Division of Ser. No. 399,690, Jul. 19, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 756,737

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—31 **10 Claims**



1. A delta modulator circuit for converting an analog signal to digital data comprising:

comparator means for comparing the magnitude of the input analog signal to a reference signal and generating a comparator signal having a high state and a low state;

clock means for providing periodic clock signal;

means for sampling said comparator signal during each cycle of said clock signal to produce a sample signal said sample signal comprising said digital data;

means for detecting a condition wherein said sample signal remains in the same state for a plurality of clock cycles and generating a slope signal in response to said condition;

reference signal means having an input for integrating said input to produce said reference signal for said comparator means; and

means for selectively coupling said sample signal to the input of said reference signal means in response to the magnitude of said slope signal.

4,622,691

MOBILE SOUND FIELD CORRECTING DEVICE

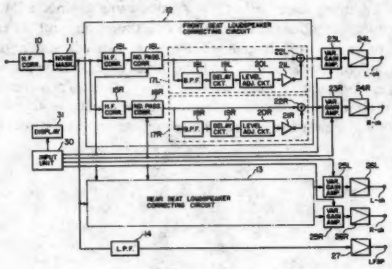
Akio Tokumo; Yoshiro Kunugi; Toshikazu Yoshimi; Shinjiro Kato; Yoshio Sasaki; Makoto Odaka, and Takeshi Sato, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 31, 1985, Ser. No. 739,954

Claims priority, application Japan, May 31, 1984, 59-111833

Int. Cl.⁴ H04S *1/00*

U.S. Cl. 381—86 **11 Claims**



1. A mobile sound field correcting system for correcting an acoustic characteristic in a vehicle sound field formed by direct waves radiated from loudspeakers and reflected waves thereof, comprising:

first correcting means for correcting a power spectrum of each loudspeaker in a frequency range higher than a frequency at which a decrease of said power spectrum in a high-frequency range of each loudspeaker starts; and

second correcting means for correcting irregularities in a frequency characteristic of said loudspeaker caused by interference of said direct waves with said reflected waves in a frequency range lower than said frequency.

4,622,692

NOISE REDUCTION SYSTEM

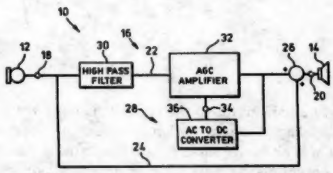
William A. Cole, Mossley, Canada, assignor to Linear Technology Inc., Burlington, Canada

Filed Oct. 10, 1984, Ser. No. 659,480

Claims priority, application Canada, Oct. 12, 1983, 438781

Int. Cl.⁴ H04R *25/00*

U.S. Cl. 381—94 **2 Claims**



1. Apparatus for enhancing the intelligibility of an audio-frequency electric speech signal corrupted by low frequency noise, comprising:

(a) an input terminal for receiving said speech signal,

(b) an output terminal,

(c) summing means for adding together signals applied thereto to produce a sum signal, said summing means being connected to said output terminal,

(d) a broadband channel connected between said input terminal and said summing means for producing from the

speech signal a corresponding broadband signal and applying said broadband signal to said summing means,

(e) a high-pass channel connected in parallel with said broadband channel between said input terminal and said summing means and comprising:

(i) a high-pass filter connected to said input terminal for producing from said speech signal a high-pass signal which is substantially free of selected low-frequency components,

(ii) an automatic gain control amplifier connected to said high-pass filter and having an output, for producing from said high-pass signal an amplified high-pass signal,

(iii) said amplifier having a gain control terminal, and means responsive to the amplitude of a signal received at said gain control terminal for varying inversely therewith the gain of said amplifier,

(iv) means connected to said output of said amplifier for rectifying said amplified high-pass signal and applying such rectified high-pass signal to said gain control terminal, for varying the gain of said amplifier inversely with the amplitude of said amplified high-pass signal,

(v) the parameters of said amplifier being set such that said amplifier has substantially greater gain than that of said broadband channel when said high-pass signal is of low amplitude and such that the contribution of said amplified high-pass signal to said sum signal is small when said high-pass signal is of high amplitude,

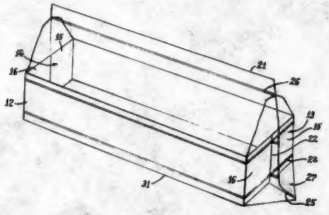
so that when said high-pass signal is of low amplitude, the contribution of said amplified high-pass signal enhances the intelligibility of said sum signal, and when said high-pass signal is of high amplitude, said sum signal will more faithfully represent natural sounding speech.

4,622,693

COLLAPSIBLE BAG AND LINER COMBINATION

Laurie G. Mykleby, Palos Park, Ill., assignor to CVP Systems, Inc., Downers Grove, Ill.

Filed Apr. 22, 1985, Ser. No. 725,926
Int. Cl.[4] B65D *33/02*
U.S. Cl. 383—119 **22 Claims**



1. A packaging assembly comprising:

a protective liner constructed of rigid or semi-rigid, protrusion resistant material having two side walls, a bottom wall, and two end walls, each said end wall comprising two end portions, said protective liner provided with joints along a central, longitudinal portion of said bottom wall, at an intersection of each said side wall with each said end wall, at an intersection of each said side wall with said bottom wall, and at an intersection of said end portions forming each of said end walls, said liner when folded upon itself along said joints forming a flat form with each said end portion extended outwardly from its adjacent side wall; and

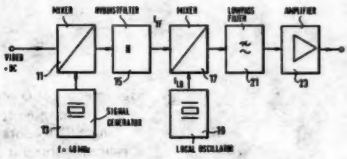
an outer bag of flexible sheet material closed except for an open top and being wider than the length of said protective liner side wall plus two adjacent said end wall portions when folded flat, the inner surface of said bag attached to the outer surface of said liner along an upper portion of said side and end walls, said central bottom joint of said protective liner being located adjacent the bottom of said bag whereby said packaging assembly may be folded flat for storage and transport and converted to a substantially rectangular box closed on five sides by said liner providing side, end, and bottom walls when said outer bag is opened, and said open top of said bag extending beyond the top opening of said side and end walls of said liner.

4,622,694

TRANSMISSION SYSTEM FOR TV SIGNALS ON RADIO LINKS

Herbert Weber, and Hans-Peter Lier, both of Backnang, Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Aug. 16, 1984, Ser. No. 641,259
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1983, 3330163
Int. Cl.[4] H04B *1/68*
U.S. Cl. 455—47 **1 Claim**



1. In a system for transmitting television signals on a radio link, the system including a transmitter having a modulating means for modulating a carrier signal to produce a vestigial sideband amplitude modulated signal for transmission, and modulating means including a first conversion means for converting the frequency of video signals to an intermediate frequency and a second conversion means for converting the intermediate frequency of the video signals to a radio frequency, the system further including a receiver having a demodulating means for demodulating a received vestigial sideband amplitude modulated signal, the improvement wherein said modulating means includes a Nyquist filter connected between said first and second conversion means, and said demodulating means includes a filter having a bandpass characteristic for processing the signal to be demodulated and wherein the television signals are free of a DC component, said transmitter includes means for completely suppressing the carrier signal prior to transmission, so that only single sideband modulated signals are transmitted which have an amplitude versus frequency characteristic which defines a Nyquist flank in a frequency range centered on the frequency of the carrier signal, said means comprises a double balanced mixer, and said receiver includes means for recovering the carrier by correlation of sideband information in the frequency region of the Nyquist flank.

4,622,695

CHANNEL SCAN ALLOCATION ARRANGEMENT

Douglas L. Whiting, South Pasadena, Calif., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 25, 1985, Ser. No. 704,987
Int. Cl.[4] H04B *1/00, 7/00*; H04M *11/00*
U.S. Cl. 455—58 **7 Claims**

1. A channel scan allocation arrangement for a system utilizing a predetermined number (N) of channels, and comprising:

a first communication unit including a first transmitter and a first receiver;

a second communication unit including a second transmitter and a second receiver, an ID code being required for communication between the first and second units;

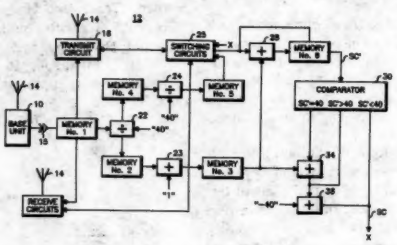
means for transferring at least the ID code from the first unit to the second unit;

first divider means for dividing the numerical value of said ID code by N, providing a whole number quotient and a first remainder;

first adder means for adding 1 to said remainder, to provide a step value SV;

second divider means for dividing said quotient by N, providing a first channel number PC;

second adder means for adding PC and SV to provide a second channel number SC';



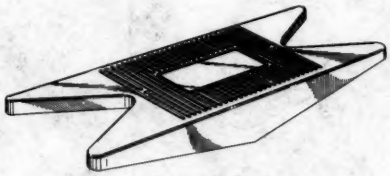
logic means for comparing the value of SC' with the value of N to determine relative value and, when necessary, modifying SC' to obtain a value SC not greater than N; and

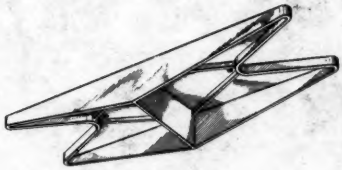
a switcihng circuit coupled to the logic means for coupling either PC or SC to the second transmitter and the second receiver.

DESIGNS

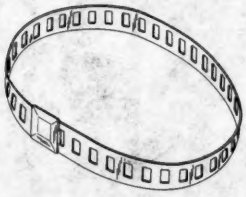
NOVEMBER 11, 1986

286,580
BOOT JACK
Richard C. Stirling, Cheltenham, England, assignor to Naturewatch Limited, Cheltenham, England
Filed Mar. 22, 1984, Ser. No. 592,221
Term of patent 14 years
U.S. Cl. D2—642





286,581
BELT
Erik O. Panth, Östhammar, Sweden, assignor to Panth-Produkter AB, Östhammar, Sweden
Filed Apr. 1, 1985, Ser. No. 722,049
Claims priority, application Sweden, Oct. 1, 1984, 84-2641
Term of patent 14 years
U.S. Cl. D2—636

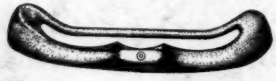


286,582
NOTE PAD WALLET OR THE LIKE
Arthur A. Phelps, 11852 Chateau Dr., Woodburn, Oreg. 97017
Filed Apr. 4, 1984, Ser. No. 596,606
Term of patent 14 years
U.S. Cl. D3—58

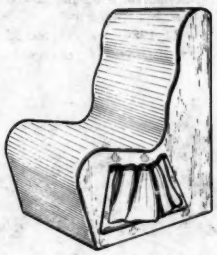
286,583
COMBINED KEY HOLDER AND SELF PROTECTION DEVICE
Jonny N. D. Filsinger, 7947 Carol Elaine Cir., Bartlett, and Patrick E. Long, 2135 Morning Vista, Memphis, both of Tenn. 38134
Filed Jul. 16, 1984, Ser. No. 631,328
Term of patent 14 years
U.S. Cl. D3—62

286,584
GARMENT HANGER
Russell Blanchard, Zeeland, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.
Filed Dec. 13, 1984, Ser. No. 681,147
Term of patent 14 years
U.S. Cl. D6—318

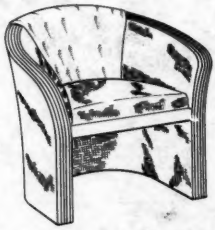
286,585
GARMENT HANGER
Russell Blanchard, Zeeland, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.
Filed Dec. 13, 1984, Ser. No. 681,483
Term of patent 14 years
U.S. Cl. D6—319



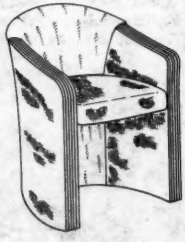
286,586
CHAIR
Warren S. Radford, 29325 Edgedale Rd., Cleveland, Ohio 44124
Filed Apr. 10, 1984, Ser. No. 598,919
Term of patent 14 years
U.S. Cl. D6—334



286,587
CHAIR
Randy R. Culler, High Point, N.C., assignor to Carson's, Inc., High Point, N.C.
Filed Oct. 15, 1984, Ser. No. 660,872
Term of patent 14 years
U.S. Cl. D6—334

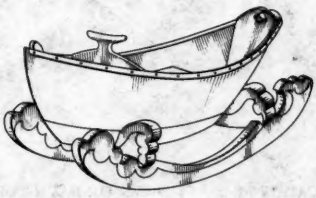


286,588
CHAIR
Randy R. Culler, High Point, N.C., assignor to Carson's, Inc., High Point, N.C.
Filed Oct. 15, 1984, Ser. No. 662,434
Term of patent 14 years
U.S. Cl. D6—334



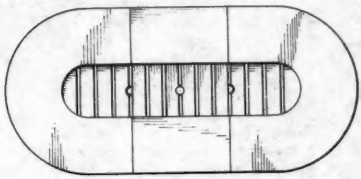
286,589
CHAIR
Donald C. Petitt, New York, N.Y., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Jan. 16, 1984, Ser. No. 571,282
Term of patent 14 years
U.S. Cl. D6—373

286,590
CRADLE
Buckley Smith, 191 St. Botolph St., Boston, Mass. 02116
Filed May 9, 1984, Ser. No. 608,554
Term of patent 14 years
U.S. Cl. D6—390

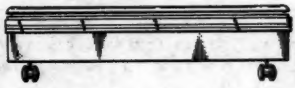


286,591
SUPPORT STAND FOR BEVERAGE CONTAINERS
John R. Russell, Rte. 1, Box 73C, Kamiah, Id. 83536
Filed May 25, 1984, Ser. No. 614,054
Term of patent 14 years
U.S. Cl. D6—417

286,592
TABLE
Didier Deconinck, Seyssins, France, assignor to Allibert SA, Grenoble, France
Filed Feb. 10, 1984, Ser. No. 579,077
Claims priority, application Hague, Aug. 12, 1983, DM/002788
Term of patent 14 years
U.S. Cl. D6—430

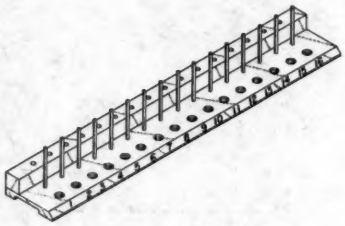


286,593
NIGHT TABLE
Kenichirou Yosimoto, Hiroshima, Japan, assignor to Dream Sogo Kenkyusho, Hiroshima, Japan
Filed Apr. 12, 1984, Ser. No. 599,382
Claims priority, application Japan, Oct. 18, 1983, 58-045291
Term of patent 14 years
U.S. Cl. D6—440

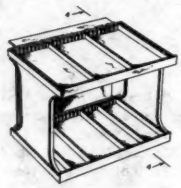


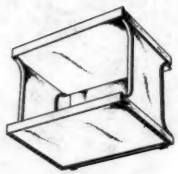
286,594
SUPPORT STAND FOR A SPHERE
John B. Gummere, Tucson, Ariz., assignor to Engineering & Research Assoc., Inc., Tucson, Ariz.
Filed May 14, 1984, Ser. No. 609,758
Term of patent 14 years
U.S. Cl. D6—455

286,595
HOLDER FOR DISASSEMBLED ENGINE PARTS
Henry W. Haskell, R.F.D. #1, Salisbury, Vt. 05769
Filed Sep. 23, 1983, Ser. No. 535,221
Term of patent 14 years
U.S. Cl. D6—467

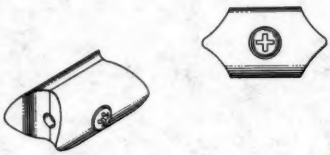


286,596
MODULAR DISPLAY FOR SMALL ARTICLES
Daniel W. Leo, Sr., New York, N.Y., assignor to Ledan, Inc., New York, N.Y.
Filed Jun. 28, 1984, Ser. No. 625,832
Term of patent 14 years
U.S. Cl. D6—476

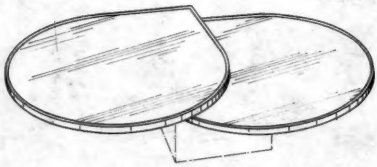




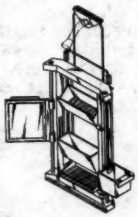
286,597
COMBINED CONNECTOR AND SPACER FOR USE PRIMARILY ON TUBULAR LEG SUPPORTS
Gerry A. Hughes, Murfreesboro, Tenn., assignor to Samsonite Corporation, Denver, Colo.
Filed Apr. 23, 1984, Ser. No. 602,669
Term of patent 14 years
U.S. Cl. D6—491

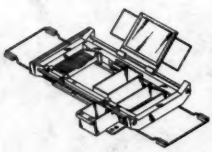


286,598
TABLE TOP
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Apr. 19, 1984, Ser. No. 602,070
Term of patent 14 years
U.S. Cl. D6—511



286,599
CADDY FOR A SHOWER OR BATH TUB
Howard Sussman, 3101 NW. 25th St., Pompano Beach, Fla. 33060
Filed Jun. 15, 1984, Ser. No. 621,163
Term of patent 14 years
U.S. Cl. D6—525



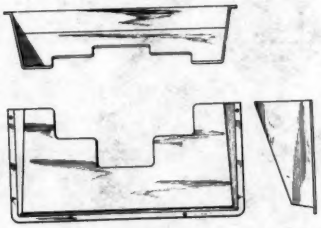


286,600

WALL MOUNTED RECEPTACLE

Stephen T. Meyer, and C. Rodger Meyer, both of Hamilton County, Ind., assignors to Deflecto Corporation, Indianapolis, Ind.

Filed Jun. 27, 1984, Ser. No. 625,098
Term of patent 14 years
U.S. Cl. D6—573

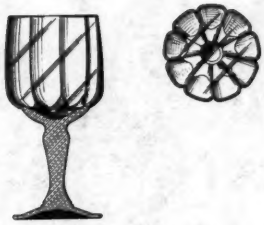


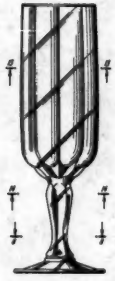
286,601

GOBLET OR SIMILAR ARTICLE

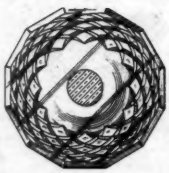
Jean-Jacques Durand, LaButte, 62510, Arques, France

Filed Nov. 1, 1983, Ser. No. 547,727
Term of patent 14 years
U.S. Cl. D7—11

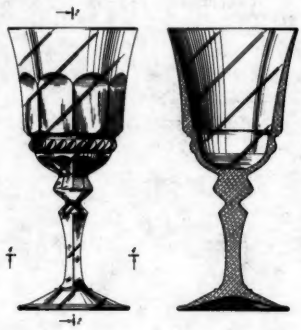


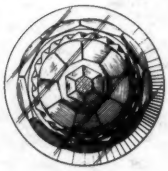


286,602
GOBLET OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Dec. 12, 1984, Ser. No. 680,793
Term of patent 14 years
U.S. Cl. D7—11

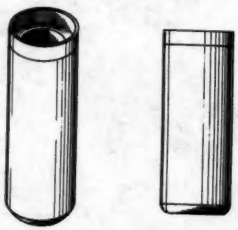


286,603
GOBLET OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Dec. 12, 1984, Ser. No. 680,794
Term of patent 14 years
U.S. Cl. D7—11

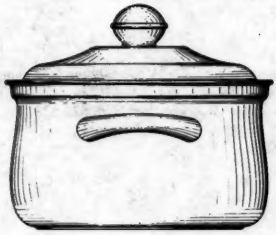




286,604
TUMBLER
James R. Bierlein, 4234 Derbyshire Ct., Salt Lake City, Utah 84123, and James F. Williams, 1630 Honeybear La., Dunedin, Fla. 33528
Filed Aug. 17, 1984, Ser. No. 641,690
Term of patent 14 years
U.S. Cl. D7—15



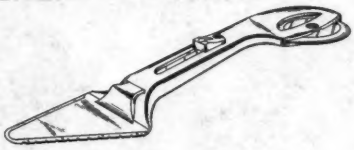
286,605
TUREEN
Carl J. Broere, Hilversum, Netherlands, assignor to Berk-Becon B.V., Doetinchem, Netherlands
Filed Sep. 7, 1984, Ser. No. 648,806
Claims priority, application Benelux, Mar. 12, 1984, 58.808-02
Term of patent 14 years
U.S. Cl. D7—17

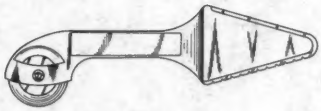


286,606
KNIT TUBULAR COVER FOR BEVERAGE CONTAINER
James J. Curtis, and Edward A. Bourgo, both of 6604 N. Mississippi Ave., Portland, Oreg. 97217
Filed Jul. 8, 1983, Ser. No. 512,159
Term of patent 14 years
U.S. Cl. D7—45

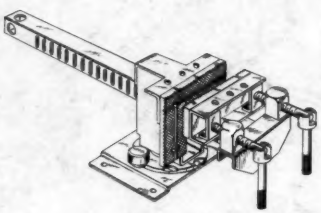
286,607
PEPPER MILL
Tom David, Nantucket Island, Mass., assignor to Tom David, Inc., Nantucket Island, Mass.
Filed Feb. 1, 1984, Ser. No. 575,990
Term of patent 14 years
U.S. Cl. D7—53

286,608
COMBINED FOOD CUTTER AND SERVER
Pak H. Leung, 95 Wai Yip St., 1/Fl., Wing Ying Ind. Bldg., Kwun Tong, Kowloon, Hong Kong
Filed Sep. 17, 1984, Ser. No. 651,265
Claims priority, application United Kingdom, Jul. 23, 1984, 1021072
Term of patent 14 years
U.S. Cl. D7—106

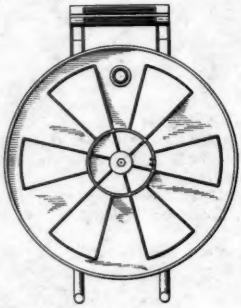


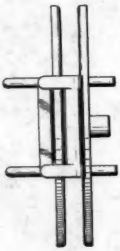


286,609
VISE
Ronald P. Hickman, St. Brelade, Channel Islands; Ralph J. Secoura, Baltimore, and David M. Dunker, Easton, both of Md., assignors to Black & Decker Inc., Newark, Del.
Filed May 2, 1983, Ser. No. 490,422
Term of patent 14 years
U.S. Cl. D8—74

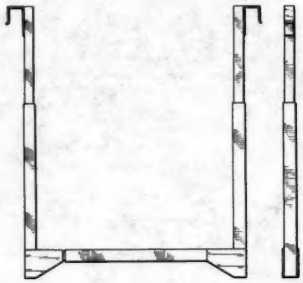


286,610
PORTABLE DRUM REEL FOR FLATTENED TUBE
Giacomo Brusadin, Pordenone, Italy, assignor to Uniflex Utiltime S.p.A., Pordenone, Italy
Filed Jul. 9, 1984, Ser. No. 629,074
Term of patent 14 years
U.S. Cl. D8—359





286,611
SUPPORT HANGER FOR A SHELF
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Aug. 10, 1984, Ser. No. 639,322
Term of patent 14 years
U.S. Cl. D8—381



286,612
TACK
William E. Adams, Portersville, Pa., assignor to Adams Manufacturing, Portersville, Pa.
Filed Jun. 25, 1984, Ser. No. 624,523
Term of patent 14 years
U.S. Cl. D8—391

286,613
COMBINED PACKAGING AND DISPLAY CONTAINER FOR SMALL ARTICLES
Howard L. Weatherly, 2750 Satsuma, Dallas, Tex. 75229
Filed Oct. 11, 1983, Ser. No. 540,449
Term of patent 14 years
U.S. Cl. D9—318

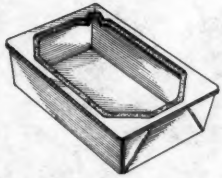
286,614
BOTTLE
William J. Melville, 1423 Beech St., Torrance, Calif. 90501
Filed Jun. 6, 1984, Ser. No. 617,751
Term of patent 14 years
U.S. Cl. D9—352

286,615
BOTTLE OR SIMILAR ARTICLE
Gerard E. Lyons, Burlington, Canada, assignor to Polybottle, Weston, Canada
Filed May 21, 1984, Ser. No. 612,111
Term of patent 14 years
U.S. Cl. D9—370

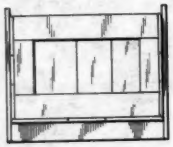
286,616
BOTTLE
Werner Becker, Lampertheim, Fed. Rep. of Germany, assignor to Fissan Dr. A. Sauer GmbH, Fed. Rep. of Germany
Filed May 2, 1984, Ser. No. 606,340
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 5262
Term of patent 14 years
U.S. Cl. D9—389

286,617
BOTTLE
William M. Goodwin, Tarrytown, and John M. Warriner, New York, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.
Filed May 14, 1984, Ser. No. 610,051
Term of patent 14 years
U.S. Cl. D9—393

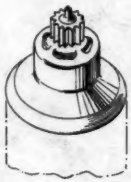
286,618
PACKAGING TRAY FOR FOOD OR THE LIKE
John E. Kea, New Castle, Del., and Louis C. Woyce, Downington, Pa., assignors to Westvaco Corporation, New York, N.Y.
Filed Aug. 3, 1984, Ser. No. 637,604
Term of patent 14 years
U.S. Cl. D9—416



286,619
MERCHANDISING CRATE
Rudy Slucker, 49-33 31st Pl., Long Island City, N.Y. 11101
Filed Apr. 2, 1985, Ser. No. 718,890
Term of patent 14 years
U.S. Cl. D9—432

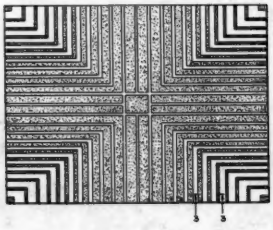


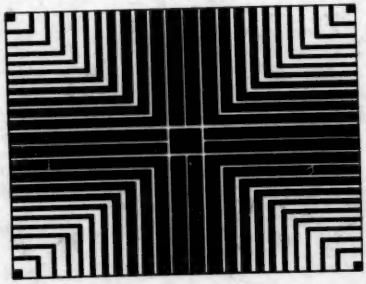
286,620
COMBINED CAP AND END PLUG STRUCTURE FOR EXTRUSION TUBES AND THE LIKE
Bernard Schneider, Sainte Ménehould, France, assignor to Tuboplast s.a., Paris, France
Filed Jan. 3, 1984, Ser. No. 568,242
Term of patent 14 years
U.S. Cl. D9—435

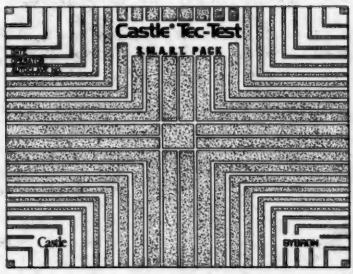


286,621
DESIGN FOR A WRISTWATCH
Alain-Dominique Perrin, 32, avenue Impératrice Joséphine, 92500 Rueil-Malmaison, France
Division of Ser. No. 433,095, Oct. 6, 1982, Pat. No. Des. 278,693. This application Feb. 5, 1985, Ser. No. 687,463
Claims priority, application France, Apr. 6, 1982, 821,203; Apr. 16, 1982, 821,342
Term of patent 14 years
U.S. Cl. D10—32

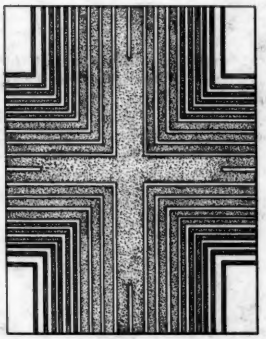
286,622
THERMAL INDICATOR FOR VACUUM STERILIZER TEST PACKS
Egidio L. de Oliveira, Fairport, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed Nov. 15, 1983, Ser. No. 551,961
Term of patent 14 years
U.S. Cl. D10—57



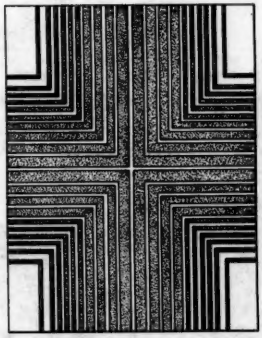




286,623
NECKLACE
Marina Bulgari, Athens, Greece, assignor to Marina B. Creation, S.A., Vaduz, Liechtenstein
Filed Oct. 9, 1984, Ser. No. 658,636
Claims priority, application Italy, Apr. 9, 1984, 35716/84[U]
Term of patent 14 years
U.S. Cl. D11—6



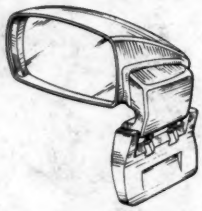
286,624
BRACELET
Marina Bulgari, Athens, Greece, assignor to Marina B. Creation, S.A., Vaduz, Liechtenstein
Filed Oct. 9, 1984, Ser. No. 658,637
Claims priority, application Italy, Apr. 9, 1984, 35708/84[U]
Term of patent 14 years
U.S. Cl. D11—6



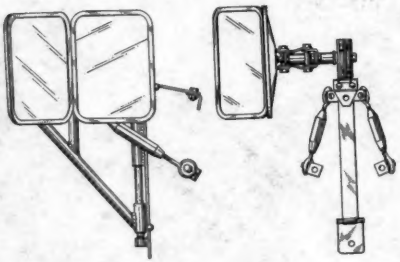
286,625
COMBINED WALKING AID AND CART
Michael Brennan, 35 Upper Library Street, Belfast, Ireland
Filed Dec. 20, 1983, Ser. No. 566,506
Claims priority, application United Kingdom, Jun. 28, 1983, 1013809
Term of patent 14 years
U.S. Cl. D12—130

286,626
INVALID CHAIR
Elizabeth A. Britz, 2303 First St., New Port Richy, Fla. 33552
Filed Dec. 14, 1984, Ser. No. 682,025
Term of patent 14 years
U.S. Cl. D12—128

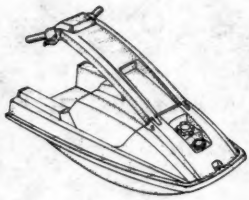
286,627
VEHICLE REAR VIEW MIRROR
Alberto Vitaloni, Turin, Italy, assignor to Vitaloni S.p.A., Turin, Italy
Filed May 25, 1984, Ser. No. 613,988
Claims priority, application Italy, Mar. 21, 1984, 53161/84[U]
Term of patent 14 years
U.S. Cl. D12—187



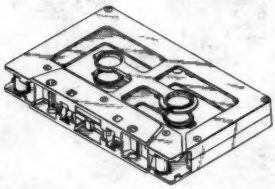
286,628
REAR VIEW MIRROR ASSEMBLY FOR A PICKUP TRUCK, OR SIMILAR ARTICLE
Abbie M. Lusk, 5618 Tilton Ave.-Apt. 61, Riverside, Calif. 92509
Filed Mar. 7, 1984, Ser. No. 587,206
Term of patent 14 years
U.S. Cl. D12—187



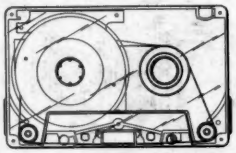
286,629
MOTORBOAT
Toshiro Suzuki, Kobe, and Seiichi Ino, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed Jul. 25, 1984, Ser. No. 634,309
Claims priority, application Japan, Feb. 7, 1984, 59-3977
Term of patent 14 years
U.S. Cl. D12—307



286,630
CASSETTE TAPE MAGAZINE
Kouji Kisanuki, Iruma, Japan, assignor to TEAC Corporation, Tokyo, Japan
Filed Jun. 11, 1984, Ser. No. 595,741
Claims priority, application Japan, Jan. 12, 1984, 59-611
Term of patent 14 years
U.S. Cl. D14—11



286,631
ENDLESS CASSETTE TAPE
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan
Filed Feb. 16, 1984, Ser. No. 580,726
Term of patent 14 years
U.S. Cl. D14—11



286,632

HEADPHONE

Laurentius F. D. Teunis, Geldrop, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1984, Ser. No. 671,257

Claims priority, application United Kingdom, May 30, 1984, 1.019.979

Term of patent 14 years

U.S. Cl. D14—36

286,633

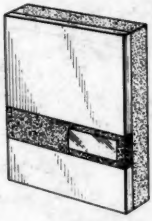
ENERGY MANAGEMENT CONTROL MODULE

Rodney M. Pauser, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 14, 1983, Ser. No. 561,447

Term of patent 14 years

U.S. Cl. D14—52



286,634

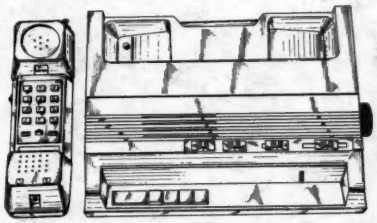
CORDLESS HANDSET AND STAND TELEPHONE UNIT

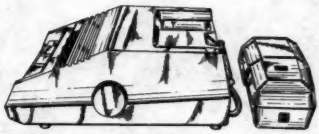
Arthur T. Martinez, Long Beach, Calif., assignor to Fortel, Inc., Compton, Calif.

Filed Jun. 25, 1984, Ser. No. 624,477

Term of patent 14 years

U.S. Cl. D14—53





286,635

TELEPHONE AMPLIFIER

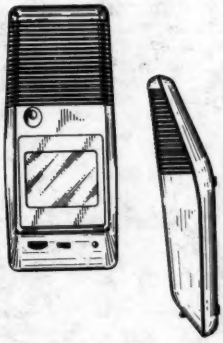
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong

Filed Jul. 16, 1984, Ser. No. 631,400

Claims priority, application United Kingdom, Feb. 15, 1984, 1017897

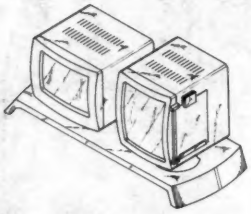
Term of patent 14 years

U.S. Cl. D14—57

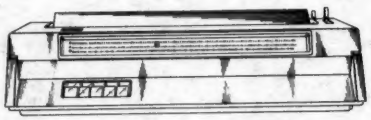


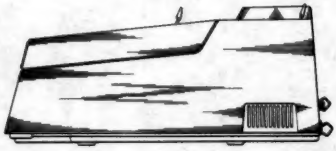
286,636
WALL HOLDER FOR A CORDLESS HANDSET TELEPHONE
Kenneth R. Cooke, New York, and Vito L. Porcelli, Ossining, both of N.Y., assignors to AT&T Technologies, Inc., Murray Hill, N.J.
Filed Feb. 29, 1984, Ser. No. 596,848
Term of patent 14 years
U.S. Cl. D14—61

286,637
PAGE COMPOSER CONSOLE
Lewis W. Bennett, Nashua, N.H., assignor to Itek Graphix Corp., Waltham, Mass.
Filed Apr. 18, 1984, Ser. No. 601,415
Term of patent 14 years
U.S. Cl. D14—100

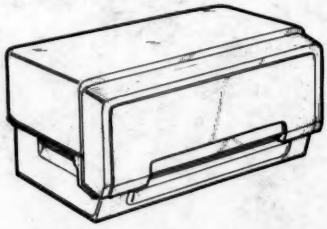


286,638
PRINTER
Peter J. Mendel, and James P. Wang, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 19, 1984, Ser. No. 602,233
Term of patent 14 years
U.S. Cl. D14—111





286,639
PRINTER FOR DATA TERMINALS
Hans E. Strand, Upsala, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Apr. 25, 1984, Ser. No. 603,614
Claims priority, application Sweden, Oct. 27, 1983, 83-2795
Term of patent 14 years
U.S. Cl. D14—111



286,640

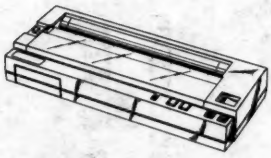
PRINTER

Kunihide Miyazaki, Yokohama, Japan, assignor to Jeco Co., Ltd., Kanagawa, Japan

Filed Dec. 27, 1984, Ser. No. 686,574

Term of patent 14 years

U.S. Cl. D14—111



286,641

VIDEO DISPLAY TERMINAL

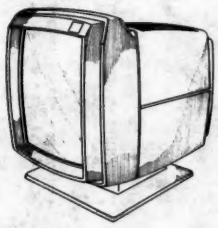
Can I. Gundogan, Boston, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Jul. 18, 1983, Ser. No. 514,745

The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—113



286,642

ROAD SURFACE CUTTER

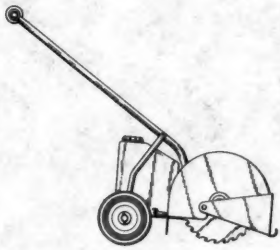
Alan R. Morris, and Ronald P. Parker, both of Heage, England, assignors to Bowmer & Kirkland Product Sales Ltd., Derbyshire, England

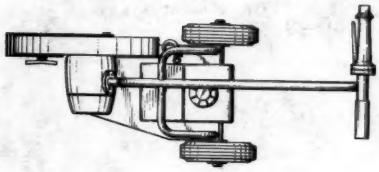
Filed May 18, 1984, Ser. No. 611,571

Claims priority, application United Kingdom, Nov. 19, 1983, 1016369

Term of patent 14 years

U.S. Cl. D15—10





286,643

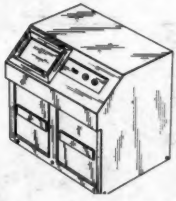
CAN CRUSHING MACHINE

George W. Carney, Peculiar, and Wilburn D. Everman, Belton, both of Mo., assignors to R. Elliot Morgan, Grain Valley, Mo.

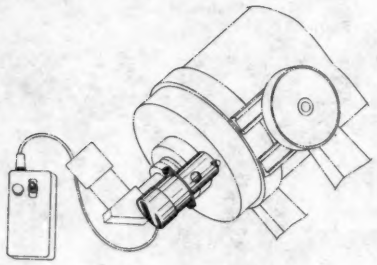
Filed Mar. 22, 1984, Ser. No. 592,383

Term of patent 14 years

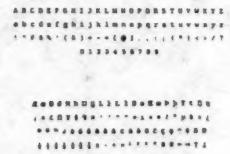
U.S. Cl. D15—123



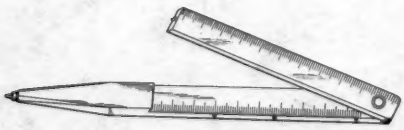
286,644
MOTOR CONTROLLED FOCUSSING ATTACHMENT FOR TELESCOPES
James D. Burr, 1960 County Rd. 23, Evergreen, Colo. 80439
Filed Apr. 5, 1984, Ser. No. 597,081
Term of patent 14 years
U.S. Cl. D16—134



286,645
FONT OF TYPE
Paul G. Parenteau, Beacon Falls, Conn., assignor to Exxon Printing Systems, Inc., Brookfield, Conn.
Filed May 14, 1984, Ser. No. 610,000
Term of patent 14 years
U.S. Cl. D18—24



286,646
COMBINED WRITING INSTRUMENT AND FOLDING POCKET MEASURE
Gian L. Mori, Strada dal Cascinotto, 119, Torino, Italy
Filed Feb. 24, 1984, Ser. No. 610,951
Claims priority, application Italy, Sep. 8, 1983, 53693/83[U]
Term of patent 14 years
U.S. Cl. D19—36



286,647
WRITING INSTRUMENT
Alain-Dominique Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands
Filed Dec. 19, 1984, Ser. No. 683,471
Claims priority, application France, Jun. 19, 1984, 84 2750
Term of patent 14 years
U.S. Cl. D19—47

286,648
WRITING INSTRUMENT
Alain-Dominique Perrin, Rueil Malmaison, France, assignor to Carter International B.V., Amsterdam, Netherlands
Filed Dec. 19, 1984, Ser. No. 683,472
Claims priority, application France, Jun. 19, 1984, 84 2750
Term of patent 14 years
U.S. Cl. D19—47

286,649

CASING FOR A WRITING INSTRUMENT

Dana Hamel, Mercer County, N.J., assignor to Ritepoint, a Div. of Penn Corporation, Fenton, Mo.

Filed Jun. 6, 1984, Ser. No. 617,950

Term of patent 14 years

U.S. Cl. D19—48

286,650

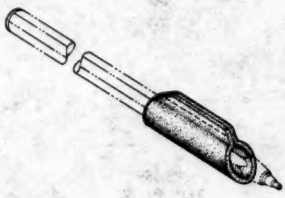
WRITING INSTRUMENT SLEEVE

John Fischer, 15100 Philomene, Allen Park, Mich. 48101

Filed May 9, 1984, Ser. No. 608,640

Term of patent 14 years

U.S. Cl. D19—55



286,651

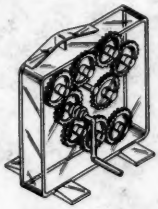
DEMONSTRATOR FOR ENGINE OIL ADDITIVE

Clinton H. Morey, Mesa, Ariz., assignor to Dolores E. Stead, Federal Way, Wash.

Filed Dec. 10, 1984, Ser. No. 679,986

Term of patent 14 years

U.S. Cl. D19—62



286,652

MODEL SKELETON

Bryan Fisher, Flat 21, 43 Wells Street, London W1, and Richard J. Millar, 5 Merton Hall Road, Wimbledon, London SW19, both of England

Filed Oct. 21, 1983, Ser. No. 544,366

Claims priority, application United Kingdom, Apr. 25, 1983, 1012680

Term of patent 14 years

U.S. Cl. D19—62

286,653

TARGET FOR TOSS GAME

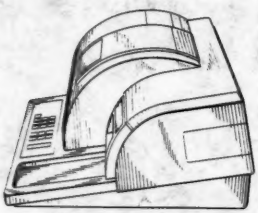
Armand Raymond, and Jean Raymond, both of 4245 Messier Street, Montreal, Canada (H2H 2H6)

Filed Feb. 23, 1984, Ser. No. 583,051

Term of patent 14 years

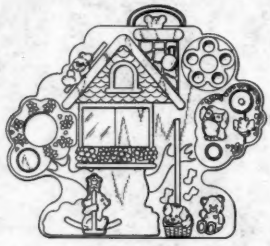
U.S. Cl. D21—4

286,654
TERMINAL FOR BETTING SYSTEM
Claude Picard, Clichy, France, assignor to Matra, Paris, France
Filed May 20, 1983, Ser. No. 496,384
Claims priority, application France, Nov. 22, 1982, 1997
Term of patent 14 years
U.S. Cl. D21—37

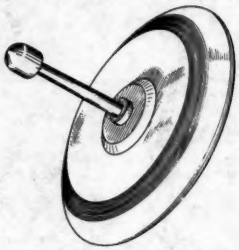


286,655
DART FLIGHT STEM
John P. Koyce, Enfield, England, assignor to Target Sports Limited, Harlow, England
Filed Sep. 26, 1984, Ser. No. 654,560
Claims priority, application United Kingdom, Apr. 6, 1984, 1018975
Term of patent 14 years
U.S. Cl. D21—49

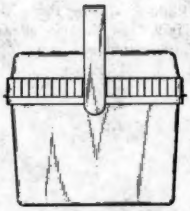
286,656
TREE HOUSE ACTIVITY TOY
Howard S. Kamentsky, Buffalo, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 23, 1985, Ser. No. 693,763
Term of patent 14 years
U.S. Cl. D21—59



286,657
LIGHTED AERIAL TOY
Tom Fields, 5000 Pilot View Dr., Pilot Hill, Calif. 95664
Filed May 2, 1983, Ser. No. 490,327
Term of patent 14 years
U.S. Cl. D21—86



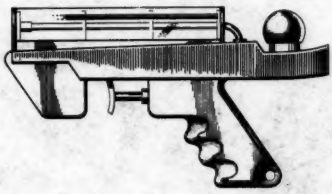
286,658
TOY BASKET
Mary E. Veness, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 23, 1985, Ser. No. 693,758
Term of patent 14 years
U.S. Cl. D21—109



286,659
TOY BOW
Ki Kwan Chu, 10-14 Kung Yip St., Unit 4-8, 10th Flr., Wah fat Industrial Bldg, Kwai Chung, tsuen Wan, N.T., Kowloon, Hong Kong
Filed Apr. 12, 1984, Ser. No. 599,469
Claims priority, application United Kingdom, Oct. 21, 1983, 1015795
Term of patent 14 years
U.S. Cl. D21—145

286,660
TOY GUN
Francis M. L. Barthropp, 4371 Marine Dr., West Vancouver, British Columbia, Canada V7V 1P3
Filed Aug. 15, 1984, Ser. No. 641,004
Term of patent 14 years
U.S. Cl. D21—147

286,661
TOY GUN
Francis M. L. Barthropp, 4371 Marine Dr., W. Vancouver, British Columbia, Canada V7V 1P3
Filed Aug. 17, 1984, Ser. No. 641,769
Term of patent 14 years
U.S. Cl. D21—147

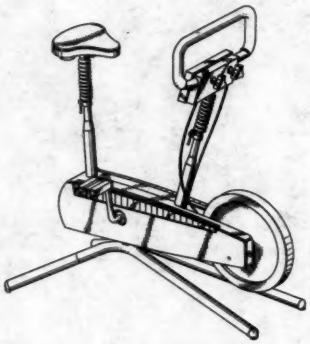


286,662
ARCHED DOG
Lynn R. Weinberg, 4 Horizon Rd. #419, Fort Lee, N.J. 07024
Filed Aug. 15, 1984, Ser. No. 640,947
Term of patent 14 years
U.S. Cl. D21—161

286,663
ARCHED CAT
Lynn R. Weinberg, 4 Horizon Rd. #419, Fort Lee, N.J. 07024
Filed Aug. 15, 1984, Ser. No. 640,946
Term of patent 14 years
U.S. Cl. D21—163

286,664
RECONFIGURABLE INSECT TOY
Takashi Matsuda, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1984, Ser. No. 643,263
Term of patent 14 years
U.S. Cl. D21—185

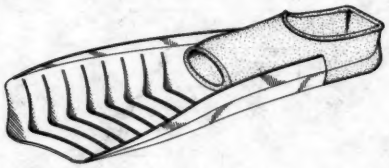
286,665
CYCLE EXERCISER
Robert C. Kelley, Opelika, Ala., assignor to Diversified Products Corporation, Opelika, Ala.
Filed Jul. 19, 1984, Ser. No. 632,576
Term of patent 14 years
U.S. Cl. D21—194



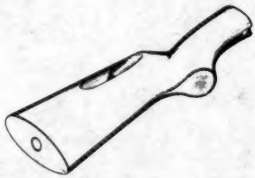
286,666
LACROSSE STICK HEAD
William H. Brine, Jr., Weston, Mass., assignor to W. H. Brine Co., Milford, Mass.
Filed Jun. 29, 1984, Ser. No. 626,061
Term of patent 14 years
U.S. Cl. D21—210

286,667
GOLF BAG SUPPORT
A. Philip Parduhn, 14501 Wilson Rd., Edmond, Okla. 73034
Filed Apr. 16, 1984, Ser. No. 600,647
Term of patent 14 years
U.S. Cl. D21—234

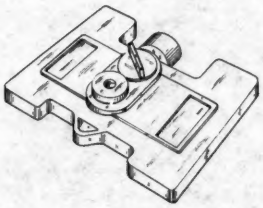
286,668
SWIM FIN
Steven M. Berenson, Sharon, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Filed Jun. 15, 1984, Ser. No. 620,962
Term of patent 14 years
U.S. Cl. D21—239



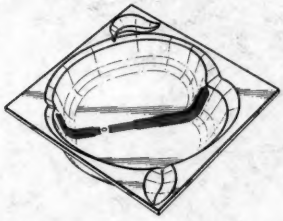
286,669
COMBINED SHOTGUN STOCK AND MAGAZINE
Lannis P. Ballard, Rancho Cordova, and William A. Davis, Sacramento, both of Calif., assignors to G. & B. Davis Company, Hayward, Calif.
Filed Feb. 6, 1984, Ser. No. 577,645
Term of patent 14 years
U.S. Cl. D22—108



286,670
SPRINKLER BASE
Jack L. Lemkin, Cincinnati, and Carl A. Peterson, Columbus, both of Ohio, assignors to The O.M. Scott & Sons Company, Marysville, Ohio
Filed May 7, 1984, Ser. No. 607,930
Term of patent 14 years
U.S. Cl. D23—7

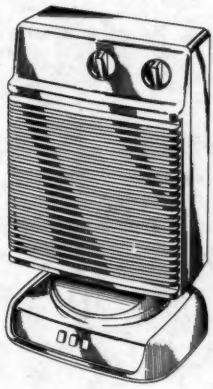


286,671
BATHTUB
William H. Griffiths, St. Albans, England, assignor to Bonsack Baths (London) Limited, West Midlands, England
Filed Dec. 26, 1984, Ser. No. 686,394
Claims priority, application United Kingdom, Jul. 5, 1984, 1020736
Term of patent 14 years
U.S. Cl. D23—55



286,672
PORTABLE ELECTRIC HEATER
Edward D. McGlynn, 30 Ridge St., Basking Ridge, N.J. 07920
Filed Jan. 23, 1985, Ser. No. 647,999
Term of patent 14 years
U.S. Cl. D23—121

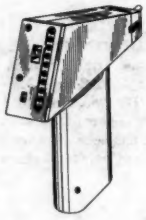
286,673
COMBINED HEATER AND FAN
Jordan Kahn, Wellesley, Mass., assignor to Holmes Products Corp., Holliston, Mass.
Filed Dec. 9, 1985, Ser. No. 806,396
Term of patent 14 years
U.S. Cl. D23—122



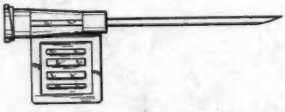
286,674
VAPOR DISPENSING DEVICE
Earl Hoyt, 210 Chickasaw Trail, Franklin Lakes, N.J. 07417, assignor to Earl Hoyt, Carlstadt, N.J.
Filed Dec. 27, 1983, Ser. No. 565,939
The portion of the term of this patent subsequent to Nov. 11, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—148

286,675
VAPOR DISPENSING DEVICE
Earl Hoyt, 210 Chickasaw Trail, Franklin Lakes, N.J. 07417, assignor to Earl Hoyt, Carlstadt, N.J.
Filed May 21, 1984, Ser. No. 612,160
The portion of the term of this patent subsequent to Nov. 11, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—148

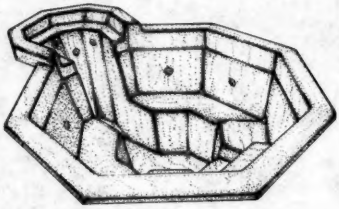
286,676
SKIN RESISTANCE PROBE
James G. McJunkin, Chula Vista, Calif., assignor to La Jolla Technology, San Diego, Calif.
Filed Jun. 15, 1983, Ser. No. 504,575
Term of patent 14 years
U.S. Cl. D24—17



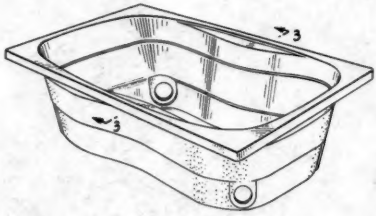
286,677
DIGITAL SUBTRACTION ANGIOGRAPHY NEEDLE
Thomas A. Osborne, Monroe County, Ind., assignor to Cook Incorporated, Bloomington, Ind.
Filed Feb. 2, 1984, Ser. No. 576,218
Term of patent 14 years
U.S. Cl. D24—24



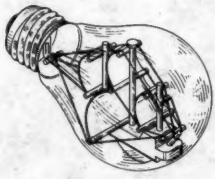
286,678
SPA
Willijan P. Remeyer, 23034 Lake Forest Dr., Ste. A, Laguna Hills, Calif. 92653
Filed Feb. 27, 1984, Ser. No. 583,721
Term of patent 14 years
U.S. Cl. D24—38



286,679
WHIRLPOOL BATH TUB
Ralph D'Innocente, Walnut Creek, and Larry Drasin, Los Angeles, both of Calif., assignors to Jacuzzi Inc., Little Rock, Ark.
Filed Dec. 4, 1985, Ser. No. 804,806
Term of patent 14 years
U.S. Cl. D24—38

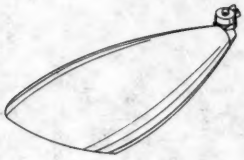


286,680
DECORATIVE LIGHT BULB FOR NIGHT LIGHT OR THE LIKE
Frank M. Saiza, 1241 Bend St., Madera, Calif. 93637
Filed Sep. 21, 1984, Ser. No. 652,912
Term of patent 14 years
U.S. Cl. D26—4



286,681
TORCH
Kung C. Hung, Tsuen Wan, Hong Kong, assignor to Freezinhot Bottle Company Limited, Tsuen Wan, Hong Kong
Filed Mar. 13, 1984, Ser. No. 589,004
Term of patent 14 years
U.S. Cl. D26—49

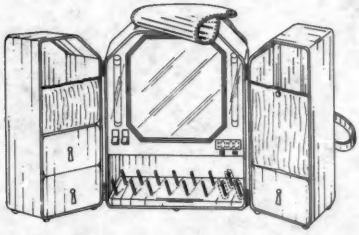
286,682
LIGHTING FIXTURE OR SIMILAR ARTICLE
Melvin D. Greenlee, Dallas, Tex., assignor to Greenlee Landscape Lighting Manufacturing Corporation, Dallas, Tex.
Filed Mar. 12, 1984, Ser. No. 588,209
Term of patent 14 years
U.S. Cl. D26—63



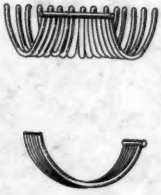
286,683
COMBINED CIGARETTE LIGHTER AND SCULPTURED CHARM
William Ficho, Lincolnwood, and Robert Addison, Chicago, both of Ill., assignors to Craker Jax Studio, Inc., Lincolnwood, Ill.
Filed Apr. 5, 1982, Ser. No. 365,141
Term of patent 14 years
U.S. Cl. D27—36

286,684
DENTAL FLOSS APPLICATOR OR SIMILAR ARTICLE
John D. H. Shao, No. 116-2, Ko Wu Road, San Min District, Kao Hsiung, Taiwan
Filed Jul. 23, 1984, Ser. No. 633,244
Term of patent 14 years
U.S. Cl. D28—64

286,685
COSMETIC CASE
Susanne Friday, Box 1, Uvalde, Tex. 78801
Filed Feb. 23, 1984, Ser. No. 582,895
Term of patent 14 years
U.S. Cl. D28—77

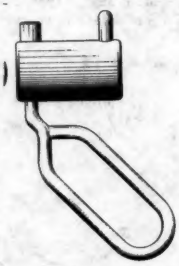


286,686
EYELID ACCESSORY OR SIMILAR ARTICLE
Isadore M. Greenberg, 29001 Cedar Rd., Lyndhurst, Ohio 44124
Division of Ser. No. 518,016, Jul. 28, 1983, Pat. No. Des. 278,086. This application Jan. 7, 1985, Ser. No. 689,163
Term of patent 14 years
U.S. Cl. D28—93

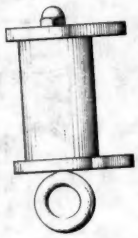


286,687
WIG ANCHOR
Nobuo Nemoto, Tokyo, Japan, assignor to Aderans Company, Ltd., Japan
Filed Apr. 5, 1984, Ser. No. 596,856
The portion of the term of this patent subsequent to Jul. 30, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—93

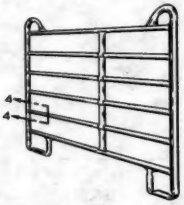
286,688
LOAD-LOWERING DEVICE
William E. Forrest, Denver, Colo., assignor to Advanced Evacuation Systems, Denver, Colo.
Filed Feb. 22, 1984, Ser. No. 582,295
Term of patent 14 years
U.S. Cl. D29—1



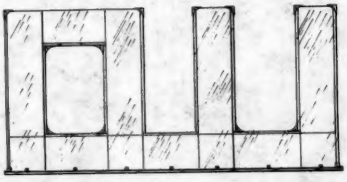
286,689
PERSONAL DESCENT CONTROL FIXTURE
William E. Forrest, Denver, Colo., assignor to Advanced Evacuation Systems, Denver, Colo.
Filed Nov. 29, 1984, Ser. No. 676,259
Term of patent 14 years
U.S. Cl. D29—1



286,690
PORTABLE CORRAL PANEL
Marvin J. Priefert, Mount Pleasant, Tex., assignor to Priefert Mfg. Co., Inc., Mt. Pleasant, Tex.
Filed Nov. 16, 1984, Ser. No. 672,083
Term of patent 14 years
U.S. Cl. D30—2

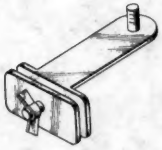


286,691
AQUARIUM
Robert D. Jones, 2102 W. Brooks, #D, Norman, Okla. 73069
Filed Dec. 3, 1984, Ser. No. 677,288
Term of patent 14 years
U.S. Cl. D30—6

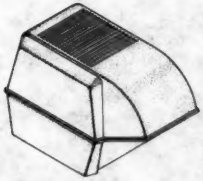


286,692
ALL PURPOSE FEEDER FOR LIVESTOCK
Thomas N. DePew, 10 Sunningdale, St. Louis, Mo. 63124
Filed Jul. 3, 1984, Ser. No. 627,461
Term of patent 14 years
U.S. Cl. D30—13

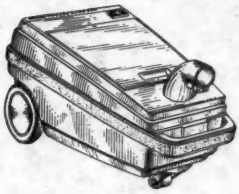
286,693
FOOD CUP BRACKET FOR BIRD CAGES
Billy J. Haywood, and Christa H. Haywood, both of 1019 Ming Ave., Bakersfield, Calif. 93307
Filed Jun. 18, 1984, Ser. No. 621,677
Term of patent 14 years
U.S. Cl. D30—18



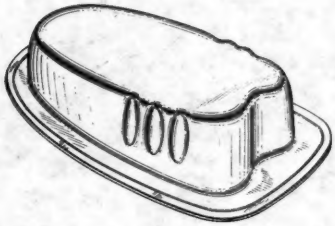
286,694
CAT LITTER BOX
Anthony O'Rourke, 439 S. Detroit St., Los Angeles, Calif. 90036
Filed Jan. 30, 1984, Ser. No. 575,392
Term of patent 14 years
U.S. Cl. D30—99



286,695
CANISTER VACUUM CLEANER
Donald L. Nupp, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jul. 16, 1984, Ser. No. 632,123
Term of patent 14 years
U.S. Cl. D32—21



286,696
OVEN CLEANING PAD
Gregory M. Gatarz, East Brunswick, and Joseph G. Banasiak, Sayreville, both of N.J., assignors to American Home Products Corporation (Del), New York, N.Y.
Filed Feb. 7, 1985, Ser. No. 699,517
Term of patent 14 years
U.S. Cl. D32—45



286,697
COMBINED AUTOMATIC DUMPING DUST PAN AND BROOM
Alpo L. Marttinen, 423 Sydenham Road, Sault Ste. Marie, Ontario, Canada (P6C 2X8)
Filed Jan. 24, 1985, Ser. No. 694,440
Claims priority, application Canada, Jul. 26, 1984, 26-07-84-9
Term of patent 14 years
U.S. Cl. D32—74

286,698

CART

Victor R. Spicer, Auckland, New Zealand, assignor to Planhorse International (NZ) Limited, Auckland, New Zealand

Filed Aug. 13, 1984, Ser. No. 640,403

Claims priority, application New Zealand, Feb. 13, 1984, 18918

Term of patent 14 years

U.S. Cl. D34—23

286,699

FISHERMAN'S CART, OR SIMILAR ARTICLE

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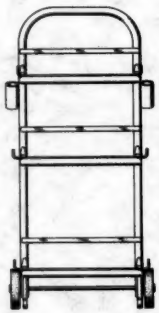

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Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, to Societe Nationale Industrielle Aerospatiale. Suspension system for a set of vehicle wheels with rigid axle. 4,621,834, Cl. 280-715.000.
Automated Controls Inc.: *See—*
Chandra, Rangasami S.; and Reyes, Jose F., 4,622,635, Cl. 364-422.000.
Automobiles Citroen: *See—*
Gabrielli, Gino, 4,621,408, Cl. 29-568.000.
Automobiles Peugeot: *See—*
Gabrielli, Gino, 4,621,408, Cl. 29-568.000.
Automotive Products plc: *See—*
Leigh-Monstevens, Keith V., 4,621,565, Cl. 92-5.00R.
Avco Corporation: *See—*
O'Connor, William, 4,622,050, Cl. 55-283.000.
Avon, Eric J.: *See—*
Pagani, R. F.; Clarke, Kenneth J.; and Avon, Eric J., 4,621,500, Cl. 62-45.000.
Avondale Industries, Inc.: *See—*
Schafer, Thomas B.; Sindelar, William, deceased; and Cummens, Joseph R., 4,621,516, Cl. 72-405.000.
Awata, Hidenori; Shimada, Shusaku; Kikuchi, Morio; and Abe, Kenichi, to Osaka Gas Company, Limited; and Kabushiki Kaisha Sofard. Microwave vacuum dryer apparatus. 4,622,448, Cl. 219-10.55A.
Ayers, Ray R.: *See—*
Kipp, Robert M.; and Ayers, Ray R., 4,621,844, Cl. 285-381.000.
Azionaria Costruzioni Macchine Automatiche (ACMA): *See—*
Aiuola, Franco; and Nannini, Luciano, 4,621,480, Cl. 53-234.000.
B.A.T. Cigaretten-Fabriken GmbH: *See—*
Borowski, Horst; Moller, Knut; Wiethaup, Wolfgang; Rodemeyer, Gunther; Henning, Paul-Georg; and Kohn, Erhard, 4,621,651, Cl. 131-361.000.
B.F. Goodrich Company, The: *See—*
Parish, James M., 4,622,027, Cl. 493-226.000.
Baasner, Bernd; Ziemann, Heinz; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of partially hydrogenated derivatives of 2-nitro-1,1,1-trifluoroalkanes. 4,622,427, Cl. 564-261.000.
Baba, Masayoshi, to Honda Giken Kogyo Kabushiki Kaisha. Headlamp system for small vehicles. 4,622,622, Cl. 362-65.000.
Baba, Yoshihiko; and Endo, Hiroshi, to Uniden Corporation. Radar detector. 4,622,553, Cl. 342-91.000.
Babb, Richard C.; and Griffin, Tommy K., to Hughes Tool Company. Apparatus and method for inserting coiled tubing. 4,621,403, Cl. 29-433.000.
Babcock, Walter C.; Tuttle, Mark E.; and Brooke, James W., to Bend Research, Inc. Recovery of ammoniacal copper with novel organogels. 4,622,344, Cl. 521-28.000.
Babcock & Wilcox Company, The: *See—*
Kneidel, Kurt E.; and Luu, Minh, 4,621,838, Cl. 285-41.000.
Babendererde, Siegmund; and Lah, Gunnar, to Hochtief Aktiengesellschaft. Method of and apparatus for the lining of a tunnel with concrete. 4,621,947, Cl. 405-146.000.
Bach, David T.: *See—*
Adamich, Marina; and Bach, David T., 4,622,188, Cl. 264-4.600.
Backer Rod Manufacturing & Supply Co.: *See—*
Gibb, John F., 4,622,251, Cl. 428-36.000.
Badura, Wolfgang; Grau, Gerhard; Widera, Axel; and Adamek, Kurt, to Buck Chemisch-Technische Werke GmbH & Co. Device for producing a decoy cloud, in particular an infrared decoy cloud. 4,621,579, Cl. 102-334.000.
Bagula, Mark: *See—*
Vora, Chandra R.; Ziegler, Michael L.; Bagula, Mark; and Hamilton, Steve, 4,622,630, Cl. 364-134.000.
Bailey, James T., Jr., to United States Forgecraft Corporation. Safety hook. 4,621,851, Cl. 294-82.200.
Bajard, Jean; and Meric, Jean-Paul. Batch interference granulometric process particularly applicable to poly-dispersed biological particles. 4,622,642, Cl. 364-555.000.
Bakeman, Paul E., Jr.; and Geipel, Henry J., Jr., to International Business Machines Corporation. CMOS contacting structure having degeneratively doped regions for the prevention of latch-up. 4,622,573, Cl. 357-42.000.
Bakx, Martinus: *See—*
Heijnen, Johan; and Bakx, Martinus, 4,621,734, Cl. 206-427.000.
Balinski, Henry A., to United States Gypsum Company. Runner and area separation wall structure utilizing runner. 4,621,470, Cl. 52-241.000.
Ball, Gregory A.; Moore, Byron E.; and Beam, Hoyt W., to Cannon Mills Company. Apparatus for fabricating pillowcases. 4,621,585, Cl. 112-10.000.
Balter, Valentin, to Huntington Mechanical Laboratories, Inc. Butterfly valve. 4,621,790, Cl. 251-305.000.
Balz, Werner: *See—*
Fitterer, Horst; Roos, Roland; Muenzner, Wulf; Balz, Werner; and Berger, Heinz, 4,621,779, Cl. 242-199.000.
Balzers Aktiengesellschaft: *See—*
Wegmann, Urs; and Rille, Eduard, 4,622,121, Cl. 204-298.000.
Baran, John S.; Lindberg, Thomas J.; and Lowrie, Harman S., to G. D. Searle & Co. Substituted glutaric acid lactones in the treatment of hyperlipidemia. 4,622,338, Cl. 514-460.000.
Barcroft Company: *See—*
Heath, Wilbur G.; and Casey, Robert B., 4,622,167, Cl. 252-315.700.
Bardoliwalla, Dinshaw F.; and Villa, Jose L., to Diamond Shamrock Chemicals Company. Aqueous drilling fluids containing fluid loss additives. 4,622,370, Cl. 526-75.000.
Bardoliwalla, Dinshaw F., to Diamond Shamrock Chemicals Company. Fluid loss control additives from AMPS polymers. 4,622,373, Cl. 526-240.000.
Barnes Engineering Company: *See—*
McKoy, Vincent; and Gupta, Amitave, 4,622,174, Cl. 252-582.000.
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., to General Foods Corporation. L-aminodicarboxylic-(O-cycloalkyl)-L-aminocarboxylate alkyl ester sweeteners. 4,622,417, Cl. 560-117.000.
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., to General Foods Corporation. L-aminodicarboxylic acid amides. 4,622,418, Cl. 560-117.000.
Barnett, Ronald E.: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,622,232, Cl. 426-548.000.
Barnhart, Kenneth T.; Golino, Carlo M.; and Quinn, Candace J., to Corning Glass Works. Method of making photochromic lenses. 4,622,184, Cl. 264-1.100.

Barre, Lucien, to Thomson-CSF. Chip carrier for high frequency power components cooled by water circulation. 4,622,621, Cl. 361-382.000.
Bartels, Harold U.; and Sveen, Finn, to Bear Medical Systems, Inc. Humidifier system. 4,621,632, Cl. 128-203.270.
Barten, Piet G. J., to U.S. Philips Corporation. Picture display panel. 4,622,492, Cl. 313-422.000.
Barton, Richard E. Read/write head positioning apparatus. 4,622,609, Cl. 360-106.000.
Bartron Corporation: *See*—
Hill, Ronald F., 4,621,942, Cl. 404-41.000.
Bartsen, Johan W.: *See*—
Dil, Jan G.; and Bartsen, Johan W., 4,622,096, Cl. 156-643.000.
Baseggio, Marcello: *See*—
Frund, Louis; and Baseggio, Marcello, 4,621,506, Cl. 66-75.100.
BASF Aktiengesellschaft: *See*—
Fitterer, Horst; Roos, Roland; Muenzner, Wulf; Balz, Werner; and Berger, Heinz, 4,621,779, Cl. 242-199.000.
Gunther, Helmut; Neumann, Stefan; and Simon, Helmut, 4,622,301, Cl. 435-146.000.
Merger, Franz; Voges, Dieter; and Winderl, Siegfried, 4,622,428, Cl. 564-480.000.
Streit, Werner; Bassing, Dieter; Gebert, Karlheinz; Klippel, Friedrich; and Leppert, Norbert, 4,622,037, Cl. 8-108.100.
BASF Corporation: *See*—
Login, Robert B.; and Anchor, Michael J., 4,622,038, Cl. 8-115.600.
BASF Farben & Fasern AG: *See*—
Geist, Michael; and Ott, Gunther, 4,622,117, Cl. 204-181.700.
Basham, Jack K.; Ho, Kenton T. T.; and Mrozek, Eric M., to TRW Inc. Fast acquisition ringing filter MSK demodulator. 4,622,683, Cl. 375-90.000.
Bassing, Dieter: *See*—
Streit, Werner; Bassing, Dieter; Gebert, Karlheinz; Klippel, Friedrich; and Leppert, Norbert, 4,622,037, Cl. 8-108.100.
Bastin, Danielle: *See*—
Broze, Guy; and Bastin, Danielle, 4,622,173, Cl. 252-528.000.
Bastow, Francis M.; and Hoffman, William C., to Savin Corporation. Automatic document feeder and registration system therefor. 4,621,799, Cl. 271-10.000.
Bates, David A.: *See*—
Sanderson, Albert M.; Pearson, Arthur; and Bates, David A., 4,621,515, Cl. 72-403.000.
Batteux, Pierre M.; and Denis, Robert M., to Merlin Gerin. Operating mechanism for a low voltage multipole circuit breaker. 4,622,529, Cl. 335-21.000.
Baubrand, Gilles: *See*—
Chapuis, Franck; Urbain, Guy; and Baubrand, Gilles, 4,622,588, Cl. 358-183.000.
Bauer, Helmut: *See*—
Krob, Erwin; and Bauer, Helmut, 4,621,829, Cl. 280-628.000.
Bauer, Walter; Farber, Heinrich; and Schneider, Rudolf, to Agfa-Gevaert Aktiengesellschaft. Arrangement for and method of transferring film. 4,621,800, Cl. 271-11.000.
Baugh, William D.: *See*—
Hanes, Ronnie M.; and Baugh, William D., 4,622,416, Cl. 560-114.000.
Baxley, William H., Jr.; and Giles, Noah Y., Jr., to Sonoco Products Company. Textile yarn carrier and method of manufacturing same. 4,621,508, Cl. 68-198.000.
Bayer Aktiengesellschaft: *See*—
Baasner, Bernd; Ziemann, Heinz; and Klauke, Erich, 4,622,427, Cl. 564-261.000.
Blank, Heinz U.; Wolters, Erich; and Neuner, Otto, 4,622,429, Cl. 568-428.000.
Bueb, Michael; Paulini, Dieter; Muschelknautz, Edgar; Wagner, Wolfram; and Groschel, Herbert, 4,622,195, Cl. 264-168.000.
Eichenauer, Herbert; Kress, Hans-Jurgen; Ott, Karl-Heinz; Peters, Horst; and Buekers, Josef, 4,622,363, Cl. 525-67.000.
Forster, Heinz; Gallenkamp, Bernd; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,622,415, Cl. 560-62.000.
Harms, Wolfgang; Wunderlich, Klaus; and Jager, Horst, 4,622,396, Cl. 544-76.000.
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Reinecke, Paul; and Brandes, Wilhelm, 4,622,335, Cl. 514-383.000.
Lantzsch, Reinhard; Ditgens, Klaus; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, 4,622,333, Cl. 514-383.000.
Lieb, Folker; Oediger, Hermann; Kabbe, Hans-Joachim; Niewohner, Ulrich; Perzborn, Elisabeth; and Seuter, Friedel, 4,622,339, Cl. 514-563.000.
Lorenz, Manfred; and Schundehutte, Karl H., 4,622,391, Cl. 534-707.000.
Reiser, Wolf; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Reinecke, Paul, 4,622,334, Cl. 514-383.000.
Sirinyan, Kirkor; Giesecke, Henning; Wolf, Gerhard D.; Ebneth, Harold; and Merten, Rudolf, 4,622,411, Cl. 556-136.000.
Wehinger, Egbert; Meyer, Horst; and Knorr, Andreas, 4,622,332, Cl. 514-356.000.
Bayle, Gerhard G.; Bijwaard, Henricus M. J.; and Janssen, Martinus M. P., to Shell Oil Company. Process for the manufacture of lubricating base oils. 4,622,129, Cl. 208-87.000.
BBC Brown, Boveri & Company, Limited: *See*—
Christl, Norbert; and Sadek, Kadry, 4,622,474, Cl. 307-105.000.
Beam, Hoyt W.: *See*—
Ball, Gregory A.; Moore, Byron E.; and Beam, Hoyt W., 4,621,585, Cl. 112-10.000.
Bear Medical Systems, Inc.: *See*—
Bartels, Harold U.; and Sveen, Finn, 4,621,632, Cl. 128-203.270.
Becher, Heinz-Manfred; Prokic-Immel, Ricarda; and Wirtz, Walter, to Celamerck GmbH & Co., KG. Urea derivatives and pesticidal compositions containing same. 4,622,340, Cl. 514-594.000.
Beck, Norman. Apparatus for entertainment, therapeutic uses and the like. 4,621,622, Cl. 128-58.000.
Becker, Helmut; and Wohlfart, Walter, to W. C. Heraeus GmbH. Operating-room light with variable illumination. 4,622,625, Cl. 362-304.000.
Becton, Dickinson and Company: *See*—
Mansour, James D.; Schulte, Thomas H.; and Sage, Burton H., 4,622,298, Cl. 435-34.000.
Bedder, Paul L.; Moses, Peter R.; Patel, Bhupendra; Reise, Terrence F.; and Taylor, Alwyn H., to Duracell Inc. Electrochemical cells. 4,622,277, Cl. 429-94.000.
Beecham Group P.L.C.: *See*—
Cantello, Barrie C. C.; and Hindley, Richard M., 4,622,342, Cl. 514-653.000.
Harbridge, John B., 4,622,177, Cl. 540-348.000.
Behling, William C.: *See*—
Walker, Jerry L.; Crummett, Donald L.; and Behling, William C., 4,621,396, Cl. 29-1.300.
Behringwerke Aktiengesellschaft: *See*—
Paques, Eric P.; and Fuhge, Peter, 4,621,631, Cl. 128-156.000.
Bell and Carlson, Incorporated: *See*—
Carlson, Gaynor V., 4,621,723, Cl. 192-71.000.
Bell, Donald: *See*—
O'Connor, Stuart; Bell, Donald; and Dean, Stuart L., 4,622,550, Cl. 340-825.050.
Bell & Howell Company: *See*—
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Bell, Isaac M., to RCA Corporation. Television receiver on-screen character display. 4,622,589, Cl. 358-183.000.
Bellis, John; and Mathers, Roy, to Mixalloy Limited. Flat products comprising at least two bonded layers. 4,622,189, Cl. 264-112.000.
Bellus, Peter A.; and Mader, Roger A., to Minnesota Mining and Manufacturing Company. Phenoxazine and phenothiazine dyes and leuco forms thereof. 4,622,395, Cl. 544-37.000.
Benard, David J., to Rockwell International Corporation. Upconversion of laser radiation frequency in an oxygen-iodine laser. 4,622,676, Cl. 372-70.000.
Bend Research, Inc.: *See*—
Babcock, Walter C.; Tuttle, Mark E.; and Brooke, James W., 4,622,344, Cl. 521-28.000.
Benjamin, James A.: *See*—
Lade, Robert W.; Benjamin, James A.; and Schutten, Herman P., 4,622,569, Cl. 357-23.400.
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,622,568, Cl. 357-23.400.
Bennett, M. Owen: *See*—
Cowans, Kenneth W.; and Bennett, M. Owen, 4,622,660, Cl. 369-134.000.
Bennett, Phillip D.; and Currie, John C., to Standard Oil Company, The. Double layer capacitors. 4,622,611, Cl. 361-433.000.
Benning, Franciscus H. C.: *See*—
Withoos, Wilhelmus H. C.; Leenders, Petrus J. M.; Benning, Franciscus H. C.; and van de Meij, Johannes, 4,622,560, Cl. 346-1.100.
Benoit, Roland, to Gem Industries, Inc. Casket hardware for adjusting coffin beds. 4,621,395, Cl. 27-12.000.
Benway, Robert E., to RCA Corporation. Cathode-ray tube with an internal magnetic shield. 4,622,490, Cl. 313-402.000.
Bercot, Mark C.: *See*—
Bright, Stephen A.; Brun, Philip L.; Bercot, Mark C.; Beres, Larry A.; Brackney, Jerry A.; Bright, Timothy L.; Hockaday, David C.; and Patrick, Jeffrey L., 4,622,001, Cl. 425-549.000.
Beres, Larry A.: *See*—
Bright, Stephen A.; Brun, Philip L.; Bercot, Mark C.; Beres, Larry A.; Brackney, Jerry A.; Bright, Timothy L.; Hockaday, David C.; and Patrick, Jeffrey L., 4,622,001, Cl. 425-549.000.
Berfield, Robert C., to Shop-Vac Corporation. Bumper for wheel well. 4,621,849, Cl. 293-155.000.
Berger, Hans S.: *See*—
Amici, Francis R.; Berger, Hans S.; Mercurio, Domenic G.; McNett, John P.; and Piazza, Pietro, 4,622,020, Cl. 446-298.000.
Berger, Heinz: *See*—
Fitterer, Horst; Roos, Roland; Muenzner, Wulf; Balz, Werner; and Berger, Heinz, 4,621,779, Cl. 242-199.000.
Berghall, Christer K.; Ollikainen, Jukka S.; and Koskivaara, Timo T., to Valpak Oy. Method and apparatus for loading and unloading a storage and transport rack. 4,621,969, Cl. 414-331.000.
Bergler, Otto, to Black & Decker Overseas AG. Guide device for a mobile working tool. 4,621,427, Cl. 30-481.000.
Bergman, Clark; and Vergason, Gary E., to Multi-Arc Vacuum Systems, Inc. Electric arc vapor deposition electrode apparatus. 4,622,452, Cl. 219-121.0PR.
Bergwerksverband GmbH: *See*—
Schulz, Peter; Klein, Jurgen; and Vaupel, Knut, 4,622,008, Cl. 432-95.000.
Berkebile, Edward E., Jr.; and Bright, Edward J., to AMP Incorporated. Electrical socket having a hinged cover. 4,621,884, Cl. 339-75.0MP.
Bernasconi, Christian; Faure, Alain; and Thibonnet, Bernard, to Elf France. Homogeneous and stable composition of asphaltenic liquid hydrocarbons and additive useful as industrial fuel. 4,622,047, Cl. 44-62.000.

Bernath, Gabor; Kobor, Jeno; Kalman, Alajos; Sohar, Pal; Fulop, Ferenc; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , to Richter Gedeon Vegyeszeti Gyar R.T. 2H-azeto[2,1-a]-isoquinoline derivatives and pharmaceutical compositions containing them. 4,622,327, Cl. 514-294.000.

Bernath, Gabor; Kobor, Jeno ; Lazar, Janos; Motika, Gabor; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , to Richter Gedeon Vegyeszeti Gyart R.T. 1-cyclohexyl-3,4-dihydroisoquinoline derivatives and pharmaceutical compositions containing them. 4,622,329, Cl. 514-307.000.

Bernier, Richard E.: *See*—
Ciarcia, Ronald D.; Di Vincenzo, Gregory T.; Doughty, Dennis J.; and Bernier, Richard E., 4,622,530, Cl. 335-167.000.

Berns, Joseph F. Machine for feeding bar stock to a turning tool. 4,621,550, Cl. 82-2.500.

Bernstein, Seymour: *See*—
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,622,401, Cl. 544-405.000.

Besagni, Tullo: *See*—
Licci, Francesca; Rinaldi, Stefano; and Besagni, Tullo, 4,622,159, Cl. 252-62.630.

Beta Phase, Inc.: *See*—
Krumme, John F., 4,621,882, Cl. 339-30.000.

Better Wire Products, Inc.: *See*—
Ortel, Stanley G., 4,621,765, Cl. 229-52.0AW.

Beurskens, Johannes H. H.; and Roelevink, Bauke J., to U.S. Philips Corporation. Internally fused electric lamp with partially embedded fuse wire. 4,622,488, Cl. 313-318.000.

Beuther, Paul D.: *See*—
Huey, Larry J.; and Beuther, Paul D., 4,622,054, Cl. 65-2.000.

Beyrau, John A.: *See*—
Buske, Gary R.; Wenger, Terry L.; and Beyrau, John A., 4,622,160, Cl. 252-73.000.

Bially, Theodore; and Ditz, Marc W., to Lifeline Systems, Inc. Low battery indicator. 4,622,544, Cl. 340-636.000.

Bickes, Robert W., Jr.; Kopczewski, Michael R.; and Schwarz, Alfred C., to United States of America, Energy. Miniature plasma accelerating detonator and method of detonating insensitive materials. 4,621,577, Cl. 102-200.000.

Bielawski, Edward: *See*—
Thiel, Robert; and Bielawski, Edward, 4,621,793, Cl. 266-165.000.

Bijwaard, Henricus M. J.: *See*—
Bayle, Gerhard G.; Bijwaard, Henricus M. J.; and Janssen, Martinus M. P., 4,622,129, Cl. 208-87.000.

Binder, Hans, to USM Corporation. Workpiece holding device. 4,621,586, Cl. 112-121.120.

Bisschop, Hilbert: *See*—
Gellekink, Bernard; and Bisschop, Hilbert, 4,622,554, Cl. 342-67.000.

Black Clawson Company, The: *See*—
Chupka, David E., 4,622,132, Cl. 209-211.000.

Black & Decker Overseas AG: *See*—
Bergler, Otto, 4,621,427, Cl. 30-481.000.

Blakesley, Richard C.: *See*—
Kitchen, Richard L.; and Blakesley, Richard C., 4,621,954, Cl. 407-22.000.

Blanc, Max A., to Anderson, William B., a part interest. Floatable collar. 4,622,018, Cl. 441-123.000.

Blank, Heinz U.; Wolters, Erich; and Neuner, Otto, to Bayer Aktiengesellschaft. Process for the preparation of substituted benzaldehydes. 4,622,429, Cl. 568-428.000.

Blendax-Werke R. Schneider: *See*—
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Bloom, Jonathan J.; Marino, Michael J.; and Pepper, Edward L., Jr., to Interaction Systems, Inc. Method and apparatus for improved electronic touch mapping. 4,622,437, Cl. 178-18.000.

Bloomfield Industries, Inc.: *See*—
Roberts, Melvin F., 4,621,571, Cl. 99-280.000.

Blythe, James S.; Dinkel, Michael J.; and Stoltman, Donald D., to General Motors Corporation. Electromagnetic fuel injector with thin orifice director plate. 4,621,772, Cl. 239-585.000.

Board of Regents, Univ. of Texas System: *See*—
Weldon, William F., 4,621,561, Cl. 89-8.000.

Board of Regents, University of Texas System: *See*—
Hill, Alfred D., 4,622,463, Cl. 250-259.000.

Board of Regents, University of Washington: *See*—
Tanimoto, Steven L.; and Pfeiffer, Joseph J., Jr., 4,622,632, Cl. 364-200.000.

Board of Trustees for the Leland Stanford University, The: *See*—
Schoolnik, Gary K.; and Rothbard, Jonathan, 4,622,223, Cl. 424-92.000.

Bochis, Richard J.; Dybas, Richard A.; and Rogers, Edward F., to Merck & Co., Inc. Antiprotozoal 3-amino or substituted amino pyrazoles. 4,622,330, Cl. 514-313.000.

Boden, Richard M.: *See*—
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., 4,622,171, Cl. 252-522.00R.

Bodine, Albert G. Clamping jaw device for well servicing machine. 4,62 688, Cl. 166-75.100.

Bodor, Nicholas S., to University of Florida. Testicular-specific drug delivery. 4,622,218, Cl. 424-9.000.

Boeck, Hans-Joachim; Fryen, Jurgen; and Meyer, Ulrich, to Messerschmitt-Boelkow-Blohm GmbH. Trajectory acquisition and monitoring system. 4,622,458, Cl. 250-203.00R.

Boehne, Dale: *See*—
Stump, Lee E.; David, Eugene C.; and Boehne, Dale, 4,621,459, Cl. 51-138.000.

Boehringer Ingelheim KG: *See*—
Casals-Stenzel, Jorge; Weber, Karl-Heinz; Walther, Gerhard; Harreus, Albrecht; and Muacevic, Gojko, 4,622,319, Cl. 514-220.000.

Boeing Company, The: *See*—
Adelson, Richard L.; and Nusbaum, Franklin D., Jr., 4,622,639, Cl. 364-463.000.
Dillard, Lathe T.; and Macho, Dale C., 4,621,957, Cl. 408-93.000.
Hinshaw, Robert L., 4,621,462, Cl. 51-273.000.
Letterman, Leslie E., 4,622,091, Cl. 156-286.000.
Matsen, Marc R., 4,622,445, Cl. 219-10.410.

Boggiano, John. Apparatus for processing fava beans having pods and seeds. 4,621,572, Cl. 99-574.000.

Bogner, Ben R., to QO Chemicals, Inc. Metal cleaning. 4,622,075, Cl. 134-22.140.

Bohannon, William D., Jr.; Brent, Herbert E.; Hamilton, Alfred S.; and Kinard, Michael D., to AT&T Technologies. Apparatus for making a bonded sheath cable. 4,622,092, Cl. 156-461.000.

Bohner, Beat, to Ciba-Geigy Corporation. 3-chloro-as-triazin-5-ones. 4,622,397, Cl. 544-182.000.

Boley, Dieter; Illig, Egon; and Sturz, Wolfgang, to C. & E. Fein GmbH & Co. Device for changing tools in industrial robots. 4,621,854, Cl. 294-88.000.

Bolton, Theodore S.; and Whitwell, Robert J., to Carrier Corporation. Louver assembly. 4,621,570, Cl. 98-114.000.

Bonfils, Michel: *See*—
Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, 4,621,834, Cl. 280-715.000.

Bonnet, Maurice, to Centre National de la Recherche Scientifique (CNRA). Optical apparatus and a method of recording or instantaneously visulizing enlarged and stereoscopic images of objects. 4,621,897, Cl. 350-130.000.

Boom, Roger W.: *See*—
Eyssa, Yehia M.; Boom, Roger W.; Young, Warren C.; McIntosh, Glen E.; and Abdelsalam, Mostafa K., 4,622,531, Cl. 335-216.000.

Boon, Charles W. Readily disassembleable portable roof hoist mounted on the roof of a building for lifting heavy products to the roof from below. 4,621,741, Cl. 212-175.000.

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Kern, John M.; and Zimmer, George A., 4,622,025, Cl. 474-245.000.
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Potter, Dewey, 4,621,708, Cl. 181-144.000.

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Bowles, Dale D.; and Parmley, Charles L. Heated oxygen system and portable equipment case for hypothermia victims. 4,621,633, Cl. 128-203.170.

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Thomann, Roland; Witschi, Heinz; Brink, Heinz-Dieter; and Amann, Markus, 4,621,939, Cl. 404-4.000.

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Kaesling, Heinz; Dinkel, Emil; and Mann, Bernd, 4,621,784, Cl. 248-430.000.

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von Thun, Hans-Jurgen, 4,621,524, Cl. 73-116.000.

Brown, Charles J. Aerator device. 4,622,139, Cl. 210-170.000.

Brown, George W., to Emhart Industries, Inc. Apparatus for controlling temperature within a forehearth. 4,622,059, Cl. 65-160.000.

Brown, Lawrence B.: *See—*
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Browning, Arthur J. Process for making molded wheeled luggage. 4,621,404, Cl. 29-463.000.

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Bruehler, Arthur. Actuating and locking mechanism for sliding door. 4,621,451, Cl. 49-15.000.

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Lagakos, Nicholas; Cole, James H.; and Bucaro, Joseph A., 4,621,896, Cl. 350-96.290.

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Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Reinecke, Paul; and Brandes, Wilhelm, 4,622,335, Cl. 514-383.000.
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Badura, Wolfgang; Grau, Gerhard; Widera, Axel; and Adamek, Kurt, 4,621,579, Cl. 102-334.000.

Budd Company, The: *See—*
Iseler, Kenneth A.; Guha, Probir K.; and Yen, Robert C., 4,622,354, Cl. 523-527.000.

Budelman, Frederick T., Jr., to Machlett Laboratories, Inc., The. Electric motor controller. 4,622,500, Cl. 318-341.000.

Bueb, Michael; Paulini, Dieter; Muschelknautz, Edgar; Wagner, Wolfram; and Groschel, Herbert, to Bayer Aktiengesellschaft. Continuous process for the production of polyacrylonitrile filaments and fibers. 4,622,195, Cl. 264-168.000.

Buehler, Fritz: *See—*
Scheuchzer, Fredy; and Buehler, Fritz, 4,621,460, Cl. 51-178.000.

Buekers, Josef: *See—*
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Bukoschek, Romuald L.: *See—*
Schemmann, Hugo; and Bukoschek, Romuald L., 4,621,423, Cl. 30-43.920.

Bullock, Michael K.; Hedrick, Dennis R.; Marvin, Richard H.; and James, Edmund H., III, to International Business Machines Corporation. Web feeding mechanism. 4,621,756, Cl. 226-76.000.

Bunch, Ernest B., Jr. Delivery mechanism for paper sheet processing apparatus. 4,622,028, Cl. 493-413.000.

Burgert, Herwig. Support disc for pump diaphragm. 4,621,989, Cl. 417-383.000.

Burgess, Lester E.: *See—*
D'Intino, Joseph; Eckman, Carl E.; and Burgess, Lester E., 4,622,046, Cl. 44-51.000.

Burke, Patrick M., to Du Pont de Nemours, E. I., and Company. Hydrocarboxylation of butadiene to 3-pentenoic acid. 4,622,423, Cl. 562-522.000.

Burriss, Richard R.; and Alsop, Henry C. H. Rescue support member. 4,621,382, Cl. 5-82.00R.

Burroughs Corporation: *See—*
Hazel, Robert L.; and Chan, Gilbert Y., 4,622,659, Cl. 369-45.000.

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Bush, Joseph L.: *See—*
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Buss, Leonard A.; Loeb, Phillip J.; and Prysby, Daniel G., to Honeywell Inc. Alarm system with alarm message supervision. 4,622,539, Cl. 340-506.000.

Butterworth, Robert M.; Martin, John R.; and Willis, Edwin, to Lever Brothers Company. Aqueous fabric softening composition. 4,622,154, Cl. 252-8.800.

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Castera, Andre ; Nicolas, Jacques; and Buvat, Jean, 4,621,580, Cl. 102-334.000.

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Boley, Dieter; Illig, Egon; and Sturz, Wolfgang, 4,621,854, Cl. 294-88.000.

Cal-Wood Door: *See*—
Naslund, Edwin N., 4,621,709, Cl. 181-284.000.

Caldwell, Donald B.; and Spring, Robert J., to Adaptable Tool Company, The. Apparatus and methods for pumping solids and undesirable liquids from a well bore. 4,621,693, Cl. 166-311.000.

Calevich, Robert; and Chinchar, George V., to Goodyear Tire & Rubber Company, The. Operation and control system for comminution equipment. 4,621,773, Cl. 241-21.000.

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Callahan, James L.; Miller, Arthur F.; and Shaw, Wilfrid G., to Standard Oil Company, The. Preparation of acrylic acid and methacrylic acid in a combination fixed-fluid bed reactor. 4,622,424, Cl. 562-545.000.

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Campbell, John F. Basketball training device. 4,621,811, Cl. 273-1.50A.

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Failes, Michael; and Mouroulis, Pantazis, 4,622,460, Cl. 250-227.000.
Matteau, Michel; Braun, Howard R.; and Gardner, Christopher L., 4,622,508, Cl. 320-13.000.

Canadian Patents & Development Limited: *See*—
Shafai, Lotfollah; Kishk, Ahmed A. A.; Bridges, Ernest; and Ittipiboon, Apisak, 4,622,559, Cl. 343-786.000.

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Ball, Gregory A.; Moore, Byron E.; and Beam, Hoyt W., 4,621,585, Cl. 112-10.000.

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Honjo, Takeshi; Kitahara, Makoto; Suzuki, Yasumichi; and Takahata, Naomi, 4,622,594, Cl. 358-293.000.
Imai, Eiichi; Kobayashi, Hiroyuki; and Mitsuhashi, Yasuo, 4,622,281, Cl. 430-107.000.
Kaneda, Naoya, 4,621,917, Cl. 354-403.000.
Kato, Masatake; and Sugiura, Muneharu, 4,621,905, Cl. 350-427.000.
Nitanda, Hiroshi; Mizutani, Morikazu; Yokoyama, Taketoshi; Tamai, Jun; and Okumura, Toru, 4,621,919, Cl. 355-3.0DR.
Suga, Akira; and Okino, Tadashi, 4,622,596, Cl. 358-335.000.
Suzuki, Akiyoshi; Ina, Hideki; and Takahashi, Kazuo, 4,621,890, Cl. 350-6.100.
Takahata, Naomi; and Honjo, Takeshi, 4,621,921, Cl. 355-14.0SH.

Canova-Davis, Eleanor: *See*—
Kung, Viola T.; and Canova-Davis, Eleanor, 4,622,294, Cl. 435-7.000.

Cantello, Barrie C. C.; and Hindley, Richard M., to Beecham Group P.L.C. Secondary amines. 4,622,342, Cl. 514-653.000.

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Cap, Ferdinand. Parametric electric machine. 4,622,510, Cl. 320-1.000.

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Franz, Gunter; Reisch, Bruno; and Passler, Michel, 4,622,238, Cl. 427-45.100.

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Munari, Fausto; Tosi, Bruno; Trestianu, Sorin; and Montagner, Enzo, 4,621,534, Cl. 73-864.860.

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Reitmeier, Glenn A.; and Carlson, Curtis R., 4,622,577, Cl. 358-11.000.

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Bolton, Theodore S.; and Whitwell, Robert J., 4,621,570, Cl. 98-114.000.
Duell, Richard J.; and Whipple, Charles E., 4,621,839, Cl. 285-61.000.
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Guscott, John K.; and Casamassima, Mario D., 4,622,540, Cl. 340-531.000.

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Casey, Thomas P. Ski rack. 4,621,737, Cl. 211-70.500.

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Dureja, Prem; Casida, John E.; and Ruzo, Luis O., 4,622,315, Cl. 514-70.000.

Castera, Andre ; Nicolas, Jacques; and Buvat, Jean, to Manufacture de Machines du Haut-Rhin, S.A. Process of manufacturing a colored smoke-generating arrangement. 4,621,580, Cl. 102-334.000.

Castille, Leopold A. Waterproof cigarette lighter. 4,622,454, Cl. 219-267.000.

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Becher, Heinz-Manfred; Prokic-immel, Ricarda; and Wirtz, Walter, 4,622,340, Cl. 514-594.000.

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Bonnet, Maurice, 4,621,897, Cl. 350-130.000.

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Chimenti, Robert J. L.; Cerkanowicz, Anthony E.; and Ryan, Douglas G., 4,622,118, Cl. 204-188.000.

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Horak, Daniel; Metalova, Marie; Svec, Frantisek; Drobnik, Jaroslav; Kalal, Jaroslav; Kuzin, Michail I.; Adamian, Arnold A.; Moiseiev, Jurij V.; and Gumargalieva, Klara Z., 4,622,367, Cl. 525-381.000.

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Chandra, Rangasami S.; and Reyes, Jose F., to Automated Controls Inc. Portable display and control terminal for wells. 4,622,635, Cl. 364-422.000.

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Page, Robert P.; Cheel, John N.; Howarth, Stuart I.; and Millward, John P., 4,621,722, Cl. 192-0.055.

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Duve, Hans, 4,622,306, Cl. 436-150.000.

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Chen, Zu-fan, to North China Research Institute of Electro-Optics. Microwave apparatus for physiotherapeutic treatment of human and animal bodies. 4,621,642, Cl. 128-422.000.

Chevron Research Company: *See—*
Peeler, Robert L., 4,622,157, Cl. 252-32.70E.

Chianelli, Russell R.: *See—*
Young, Archie R.; Ho, Teh C.; Jacobson, Allan J.; and Chianelli, Russell R., 4,622,128, Cl. 208-18.000.

Chiba, Yasutsune; Arima, Shizuo; Nozawa, Katsumi; and Nomura, Hideo, to Taisan Industrial Co., Ltd. Flow control nozzle. 4,621,771, Cl. 239-585.000.

Chikano, Mitsuo; and Nakajima, Yuji, to Hoya Corporation. Camera filter. 4,621,889, Cl. 350-1.600.

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Chimenti, Robert J. L.; Cerkanowicz, Anthony E.; and Ryan, Douglas G., to Exxon Research and Engineering Company. Method and apparatus for separating wax/water from hydrocarbon oil mixture boiling in the lubricating oil range. 4,622,118, Cl. 204-188.000.

Chimenti, Robert J. L.: *See—*
Cerkanowicz, Anthony E.; Crane, Irving D.; Flannery, Brian P.; and Chimenti, Robert J. L., 4,622,119, Cl. 204-190.000.

Chinchar, George V.: *See—*
Calevich, Robert; and Chinchar, George V., 4,621,773, Cl. 241-21.000.

Chlorine Engineers Corp., Ltd.: *See—*
Satoh, Takao; Murakami, Masaki; Kawasaki, Nobuhiro; Ichisaka, Teruo; and Katayama, Shinji, 4,622,113, Cl. 204-98.000.

Christiansen, Richard L.; and Kim, Hiemi, to Marathon Oil Company. Method of determining the minimum level of gas enrichment for a miscible flood. 4,621,522, Cl. 73-61.00R.

Christl, Norbert; and Sadek, Kadry, to BBC Brown, Boveri & Company, Limited. Alternating-current filter circuit arrangement. 4,622,474, Cl. 307-105.000.

Chupka, David E., to Black Clawson Company, The. Liquid cyclone or centrifugal cleaner. 4,622,132, Cl. 209-211.000.

Chyung, Kenneth; Dwyer, Thomas J.; Foster, Gordon F.; Shoup, Robert D.; and Young, Roger A., to Corning Glass Works. Process for making thick-walled ceramic bodies from synthetic micas. 4,622,057, Cl. 65-18.100.

Ciarcia, Ronald D.; Di Vincenzo, Gregory T.; Doughty, Dennis J.; and Bernier, Richard E., to General Electric Company. Circuit breaker assembly for high speed manufacture. 4,622,530, Cl. 335-167.000.

Ciba-Geigy Corporation: *See—*
Bohner, Beat, 4,622,397, Cl. 544-182.000.
Renfroe, Harris B., 4,622,322, Cl. 514-222.000.

Cicchi, Pietro: *See—*
Wengert, Rolf; and Cicchi, Pietro, 4,622,272, Cl. 428-690.000.

Cii Honeywell Bull (Societe Anonyme): *See—*
Desserre, Jacques, 4,622,615, Cl. 360-121.000.

Citizen Watch Co., Ltd.: *See—*
Mabuchi, Hiroshi, 4,622,608, Cl. 360-106.000.

Clare, Colin P., to McMichael Limited. Acoustic direction finding systems. 4,622,657, Cl. 367-129.000.

Clarke, Kenneth J.: *See—*
Pagani, R. F.; Clarke, Kenneth J.; and Avon, Eric J., 4,621,500, Cl. 62-45.000.

Claxton, Gerald L.., to Up-Right, Inc. Oscillatory shaker rail harvester. 4,621,488, Cl. 56-330.000.

Clegg, John E. Annular solar panel. 4,621,616, Cl. 126-440.000.

Clegg, John E. Conical beam concentrator. 4,621,907, Cl. 350-432.000.

Clegg, John E. Monochromatic beam concentrator. 4,621,908, Cl. 350-432.000.

Cleveland Chair Company: *See—*
Jackson, W. Ronald; Kraus, Albert J.; and Lerdon, Wesley E., 4,621,863, Cl. 297-85.000.

Coca-Cola Company, The: *See—*
Kramer, Thomas, 4,621,862, Cl. 296-183.000.

Cohen, John H.: *See—*
Pittard, Gerard T.; McDonald, William J.; Maurer, William C.; Cohen, John H.; and Givler, Gregory C., 4,621,698, Cl. 175-305.000.

Cohen, Mitchell S., to International Business Machines Corporation. Recording materials of improved lubricity for use in electroerosion printing. 4,622,262, Cl. 428-219.000.

Cohen, Richard L., to Allied Corporation. Directional optical filter. 4,621,898, Cl. 350-276.00R.

Coldren, Larry A.; and Ebeling, Karl J., to AT&T Bell Laboratories. Self-stabilized semiconductor lasers. 4,622,672, Cl. 372-32.000.

Cole, James H.: *See—*
Lagakos, Nicholas; Cole, James H.; and Bucaro, Joseph A., 4,621,896, Cl. 350-96.290.

Cole, William A., to Linear Technology Inc. Noise reduction system. 4,622,692, Cl. 381-94.000.

Coleco Industries, Inc.: *See—*
Amici, Francis R.; Berger, Hans S.; Mercurio, Domenic G.; McNett, John P.; and Piazza, Pietro, 4,622,020, Cl. 446-298.000.

Coleman, William M., III; and Edmondson, Morris S., to Dow Chemical Company, The. Novel titanium complexes and catalysts prepared therefrom. 4,622,309, Cl. 502-115.000.

Colgate-Palmolive Co.: *See—*
Broze, Guy; and Bastin, Danielle, 4,622,173, Cl. 252-528.000.

Com Dev Ltd.: *See—*
Tang, Wai-Cheung, 4,622,523, Cl. 333-28.00R.

Commissariat a l'Energie Atomique: *See—*
Feutrel, Claude, 4,622,204, Cl. 376-442.000.

Commonwealth of Australia of c/-Department of Defence Support, The: *See—*
Waller, John C.; and Searle, Gregory C. L., 4,622,646, Cl. 364-571.000.

Compagne de Signaux et d'Entreprises Electriques: *See—*
Alt, Gilbert, 4,622,522, Cl. 333-24.00R.

Comyns, Alan E.; Morris, Gareth W.; and Sankey, John P., to Laporte Industries Limited. Method for the preparation of crystalline molecular sieve materials wherein the organic template is an enantiomer. 4,622,214, Cl. 423-277.000.

Conard, Bruce R.: *See—*
Devuyst, Eric A. P.; and Conard, Bruce R., 4,622,149, Cl. 210-717.000.

Connell, Bruce R., to Oberview Pty. Ltd. Production of prints. 4,621,923, Cl. 355-133.000.

Consiglio Nazionale Delle Ricerche: *See—*
Licci, Francesca; Rinaldi, Stefano; and Besagni, Tullo, 4,622,159, Cl. 252-62.630.

Conterm International Terminals, Inc.: *See—*
Pagani, R. F.; Clarke, Kenneth J.; and Avon, Eric J., 4,621,500, Cl. 62-45.000.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Eberhard, Gunter; Heitzig, Jurgen; and Fischer, Werner, 4,621,795, Cl. 267-8.00R.
Kohler, Josef, 4,621,998, Cl. 425-329.000.

Controlled Information Corporation: *See—*
Weaver, Jon N., 4,622,542, Cl. 340-572.000.

Controls Company of America: *See—*
DeLew, Charles A.; and Ostrowski, Edwin A., 4,621,788, Cl. 251-120.000.

Cook, Peter H.; and Hillyard, Derek W., to 600 Group Public Limited Company, The. Drive mechanism for the main spindle of a rotating tool turret machine. 4,621,405, Cl. 29-48.50R.

Cooke, Anthony R.: *See—*
Chang, Kern K. N.; Cooke, Anthony R.; and Sonneborn, Kurt J., 4,622,084, Cl. 156-89.000.

Coon, Dennis C.; Narusewicz, Michael A.; and Sanders, Ward L., to American Sterilizer Company. Cover for surgical light handle and touch panel. 4,621,735, Cl. 206-438.000.

Cooper, Erwin E.: *See—*
Crossland, Robert E.; and Cooper, Erwin E., 4,621,888, Cl. 350-1.200.

Cooper, James, to James Howden & Company Ltd. Coal burner. 4,621,582, Cl. 110-264.000.

Corcom, Inc.: *See—*
Schneider, Lon M.; and Walters, William R., 4,622,526, Cl. 333-181.000.

Corenman, James E.: *See—*
New, William, Jr.; and Corenman, James E., 4,621,643, Cl. 128-633.000.

Cornelissens, Emery G. P.; Hofland, Jurjen P.; and Mets, Lambertus C., to Akzo N.V. Dosing unit comprising a detergent and/or a bleaching agent. 4,622,161, Cl. 252-90.000.

Cornette, Swany D. Permanently residing or removable capo. 4,621,558, Cl. 84-318.000.

Corning Glass Works: *See—*
Barnhart, Kenneth T.; Golino, Carlo M.; and Quinn, Candace J., 4,622,184, Cl. 264-1.100.
Chyung, Kenneth; Dwyer, Thomas J.; Foster, Gordon F.; Shoup, Robert D.; and Young, Roger A., 4,622,057, Cl. 65-18.100.
Hansson, John N.; and Johns, Herbert L., 4,621,936, Cl. 401-215.000.

Corning Limited: *See—*
Wakefield, Douglas H., 4,621,841, Cl. 285-158.000.

Corum, Janes F. Toroidal antenna. 4,622,558, Cl. 343-742.000.

Cosden Technology, Inc.: *See—*
Hahn, Granville J.; Rutledge, Raleigh N.; Searl, Alonzo H.; and Sommerman, Walter E., 4,621,678, Cl. 165-27.000.

Cowans, Kenneth W.; and Bennett, M. Owen. Systems and methods for signal compensation. 4,622,660, Cl. 369-134.000.

Cox, Percy T.; Warren, Wayne F.; and Johnson, Donald L., Jr., to Texaco Inc. Deep penetration well logging system and method using secondary electromagnetic fields. 4,622,518, Cl. 324-341.000.

Crane, Irving D.: *See—*
Cerkanowicz, Anthony E.; Crane, Irving D.; Flannery, Brian P.; and Chimenti, Robert J. L., 4,622,119, Cl. 204-190.000.

Cregge, Robert J.· and Sabol, Jeffrey S., to Merrell Dow Pharmaceuticals Inc. Cyclohexanealkanoic acids. 4,622,422, Cl. 562-507.000.

Crevasse, Gary A.; Gammon, David L.; and Sullivan, Michael J., to Naturin-Werk Becker & Co. Method and apparatus for forming netted meat products wrapped in an edible collagen film. 4,621,482, Cl. 53-439.000.

Criscimagna, Tony N.; Hoffman, Harry S., Jr.; and Milich, Thomas J., to International Business Machines Corporation. Repetition rate

compensation and mixing in a plasma panel. 4,622,549, Cl. 340-805.000.

Crochemore, Michel, to Rhone-Poulenc Specialites Chimiques. Preparation of N,N'-bis(2-hydroxyethyl)oxamide. 4,622,426, Cl. 564-135.000.

Cromer, James M.: *See—*
Ares, Roland A.; Cromer, James M.; Schaeffer, Wayne G.; and Wehmeier, William C., 4,621,505, Cl. 62-509.000.

Crosilla, Danilo A.: *See—*
Asselin, Andre A.; Crosilla, Danilo A.; and Humber, Leslie G., 4,622,399, Cl. 546-169.000.

Crossland, Robert E.; and Cooper, Erwin E., to Texas Instruments Incorporated. Coaxial wideband refractive optical system. 4,621,888, Cl. 350-1.200.

Crownshaw, John C., to Standard Telephones and Cables Public Limited Company. Applying thermoplastics sleeve to crush resistant tubing. 4,622,197, Cl. 264-230.000.

Crummett, Donald L.: *See—*
Walker, Jerry L.; Crummett, Donald L.; and Behling, William C., 4,621,396, Cl. 29-1.300.

Cser, Daniel: *See—*
Kane, John P.; Cser, Daniel; and Dall, Robert H., 4,621,671, Cl. 157-1.100.

Cummens, Joseph R.: *See—*
Schafer, Thomas B.; Sindelar, William, deceased; and Cummens, Joseph R., 4,621,516, Cl. 72-405.000.

Cummings, Donald R.: *See—*
Tomlinson, Terence R.; and Cummings, Donald R., 4,622,053, Cl. 62-26.000.

Cummins Engine Company, Inc.: *See—*
Carey, Alfred W., Jr.; and Peters, Lester L., 4,621,605, Cl. 123-446.000.

Cummins, Joseph B. Weight lifting type exercising device. 4,621,810, Cl. 272-134.000.

Currie, John C.: *See—*
Bennett, Phillip D.; and Currie, John C., 4,622,611, Cl. 361-433.000.

Curry, Adolph. Wave-action power generator platform. 4,622,473, Cl. 290-53.000.

Curry, Douglas N., to Xerox Corporation. Polygon signature correction. 4,622,593, Cl. 358-284.000.

Curwen, Neil W. Livestock leg restrainer. 4,621,590, Cl. 119-128.000.

CVP Systems, Inc.: *See—*
Mykleby, Laurie G., 4,622,693, Cl. 383-119.000.

Czerwick, Henry E.; Petts, Richard A.; and Russell, Raymond R., to Ford Motor Company. System for neutral position shift lever clutch disengagement. 4,621,721, Cl. 192-0.052.

Daikin Kogyo Co., Ltd.: *See—*
Kitahara, Katsuhiko; Masutani, Tetsuya; Yamaoka, Takashi; Kitahaba, Tetsuo; Nisioka, Takasi; and Itami, Yasuo, 4,622,066, Cl. 71-98.000.
Ohmori, Akira; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,622,364, Cl. 525-200.000.

Daimler-Benz Aktiegesellschaft: *See—*
Schulz, Rene ; Braum, Heinrich J.; Nadolny, Kurt; and Nguyen, Van-Trung, 4,621,982, Cl. 417-201.000.

Daimler-Benz Aktiengesellschaft: *See—*
Abthoff, Jorg; Schuster, Hans-Dieter; and Schmidt, Karlwalter, 4,621,604, Cl. 123-446.000.
Knochelmann, Fred; Schulz, Manfred; and Ast, Gunther, 4,621,822, Cl. 280-5.00A.
Senft, Ernst; Hirth, Hans; and Klemmer, Herbert, 4,621,538, Cl. 74-512.000.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Fukumura, Sadaaki; Tagami, Etsuji; Hashimoto, Takeji; and Tano, Hirofumi, 4,621,428, Cl. 33-18.100.
Katsuyama, Mikizo; Fujii, Teruo; and Tanaka, Hirohisa, 4,622,591, Cl. 358-256.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Yamada, Mitsuhiko, 4,622,582, Cl. 358-80.000.

Daishowa Seiki Co., Ltd.: *See—*
Kubo, Haruaki; and Kawashita, Hidemori, 4,621,548, Cl. 82-1.200.

Dalhuisen, Peter B., to Veg-Gasinstituut N.V. Gas burner system. 4,622,004, Cl. 431-76.000.

Dall, Robert H.: *See—*
Kane, John P.; Cser, Daniel; and Dall, Robert H., 4,621,671, Cl. 157-1.100.

Dammann, Hanns-Gerd: *See—*
Simon, Bernd; Dammann, Hanns-Gerd; Muller, Peter; Legeler, Hans-Jurgen; Orth, Dieter; and Radunz, Hans-Eckart, 4,622,316, Cl. 514-162.000.

Dana Corporation: *See—*
Davison, Kent E., 4,621,540, Cl. 74-710.500.
King, Wendell B.; Rhoads, Ronald I.; and Tarbox, Robert H., 4,621,760, Cl. 228-112.000.
Zlotek, Thaddeus F., 4,621,720, Cl. 192-48.920.

Dancker, Gregory A.; and Grazier, Edwin C., to International Business Machines Corporation. Process and apparatus for testing a microprocessor and dynamic ram. 4,622,668, Cl. 371-20.000.

Danieli & C. Officine Meccaniche SpA: *See—*
Poloni, Alfredo, 4,621,554, Cl. 83-317.000.

Darrigo, Joseph M., Sr. Doll that grows. 4,622,021, Cl. 446-320.000.

Data General Corporation: *See—*
Vora, Chandra R.; Ziegler, Michael L.; Bagula, Mark; and Hamilton, Steve, 4,622,630, Cl. 364-134.000.

Dattilo, Donald P.; and Knippert, Michael S., to Energy Technologies Corp. Energy efficient reactance ballast with electronic start circuit for the operation of fluorescent lamps of various wattages at standard levels of light output as well as at increased levels of light output. 4,622,496, Cl. 315-283.000.

David, Eugene C.: *See—*
Stump, Lee E.; David, Eugene C.; and Boehne, Dale, 4,621,459, Cl. 51-138.000.

David, Stan A.: *See—*
Hammond, Joseph P.; David, Stan A.; and Woodhouse, John J., 4,621,761, Cl. 228-124.000.

Davidson, Eric H.: *See—*
Britten, Roy J.; and Davidson, Eric H., 4,622,467, Cl. 250-389.000.

Davis, James A.: *See—*
Scholman, William W., Jr.; and Davis, James A., 4,622,365, Cl. 525-332.500.

Davison, Kent E., to Dana Corporation. Axle locking differential device. 4,621,540, Cl. 74-710.500.

Dayco Corporation: *See—*
Long, Delmar D., 4,622,243, Cl. 427-176.000.
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,622,023, Cl. 474-93.000.

Dean, Stuart L.: *See—*
O'Connor, Stuart; Bell, Donald; and Dean, Stuart L., 4,622,550, Cl. 340-825.050.

DeBastiani, Giovanni; Faccioli, Giovanni; Aldegheri, Roberto; and Brivio, Lodovico R., to Orthofix S.r.l. External axial fixation device. 4,621,627, Cl. 128-92.0ZZ.

DeBernardis, John F.; and Winn, Martin, to Abbott Laboratories. 1,2,3,3a,8,8a-hexahydro-indeno[1,2-c]pyrroles useful in the treatment of hypertension. 4,622,405, Cl. 548-427.000.

DeBiase, Robert R.: *See—*
Godino, Rino L.; and DeBiase, Robert R., 4,621,724, Cl. 196-139.000.

DeCarolis, Joseph P., to Stanley Works. Ratchet screwdriver. 4,621,718, Cl. 192-43.000.

Decker, Robert W., to Ingersoll-Rand Company. Liquid intensifier unit. 4,621,988, Cl. 417-342.000.

Deeg, Wyman L. Powered sliding door safety system. 4,621,452, Cl. 49-28.000.

Dekker, Theodor G.; Oliver, Douglas W.; Snyckers, Friedrich O.; and van der Schyf, Cornelis J., to Noristan Limited. Derivatives of pentacyclo undecanes, processes for preparing these compounds, and pharmaceutical compositions thereof. 4,622,430, Cl. 564-458.000.

de Kluizenaar, Cornelis J.: *See—*
Grande, Robert; de Kluizenaar, Cornelis J.; Naunapper, Dietmar C.; and Wehrle, Karlheinz J., 4,621,437, Cl. 34-10.000.

Delage, Thierry: *See—*
Lhoste, Jean-Francois; and Delage, Thierry, 4,621,768, Cl. 239-44.000.

Delahunty, Terry W. Rotary heat exchanger with circumferential passages. 4,621,684, Cl. 165-92.000.

Delannoy, Francis: *See—*
Neel, Henri; and Delannoy, Francis, 4,622,104, Cl. 203-18.000.

DeLew, Charles A.; and Ostrowski, Edwin A., to Controls Company of America. Solenoid valve. 4,621,788, Cl. 251-120.000.

DeLucchi, Christopher J. Holder for wrench sockets. 4,621,738, Cl. 211-70.600.

deMey, Charles F.: *See—*
Hoult, Robert A.; and deMey, Charles F., 4,621,899, Cl. 350-321.000.

Denes, Laszlo : *See—*
Bernath, Gabor; Kobor, Jeno; Kalman, Alajos; Sohar, Pal; Fulop, Ferenc; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , 4,622,327, Cl. 514-294.000.
Bernath, Gabor; Kobor, Jeno ; Lazar, Janos; Motika, Gabor; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , 4,622,329, Cl. 514-307.000.

Denis, Robert M.: *See—*
Batteux, Pierre M.; and Denis, Robert M., 4,622,529, Cl. 335-21.000.

Denneny, James A., Jr.; and Rowland, Charles M., to Garrett Corporation, The. Cooling control system apparatus and method. 4,621,767, Cl. 236-92.00R.

Denton, Lynn. Brake drum drying fins. 4,621,715, Cl. 188-264.00R.

DeNuccio, Ron J.: *See—*
Leung, Chi H.; and DeNuccio, Ron J., 4,622,269, Cl. 428-550.000.

Desserre, Jacques, to Cii Honeywell Bull (Societe Anonyme). Magnetic transducer for high density recording or writing. 4,622,615, Cl. 360-121.000.

Devuyst, Eric A. P.; and Conard, Bruce R., to Inco Limited. Effluent treatment. 4,622,149, Cl. 210-717.000.

DewEze Manufacturing, Inc.: *See—*
Hostetler, Dewey L., 4,621,776, Cl. 241-101.700.

Dewson, Frederick J. Modular reusable overcast. 4,621,951, Cl. 405-303.000.

Dhawan, Sadhu R.; and Chao, Jessie, to Racal Data Communications Inc. RTS/DCD simulator. 4,622,685, Cl. 375-121.000.

Diacon, Inc.: *See—*
Frampton, Thomas J., 4,622,433, Cl. 174-52.0FP.

Diamond Shamrock Chemicals Company: *See—*
Bardoliwalla, Dinshaw F.; and Villa, Jose L., 4,622,370, Cl. 526-75.000.
Bardoliwalla, Dinshaw F., 4,622,373, Cl. 526-240.000.

Dickens, Daniel D.: *See—*
Winslow, Charles E., Jr.; Bush, Joseph L.; and Dickens, Daniel D., 4,622,216, Cl. 423-515.000.

Dicker, Ira B.; Hutchins, Clyde S.; and Spinelli, Harry J., to Du Pont de Nemours, E. I., and Company. Polymer life enhancement in oxyanion-catalyzed polymerization. 4,622,372, Cl. 526-190.000.

Didde Graphic Systems Corporation: *See*—
Faddis, Terry N.; Propheter, Howard L.; and Parks, Thomas D., 4,621,574, Cl. 101-142.000.

Diebel, Howard, to Moyer Diebel Limited. Automatically operable distillation apparatus. 4,622,102, Cl. 202-185.300.

Diemer, Willem H.; Kikkert, John N.; and Wagemans, Hubertus F. M., to U.S. Philips Corporation. X-ray tube comprising two successive layers of anode material. 4,622,688, Cl. 378-143.000.

Diesel Kiki Co., Ltd.: *See*—
Nozawa, Kazuo, 4,621,685, Cl. 165-111.000.
Thomas, David L.; and Suzuki, Nobuhiko, 4,621,983, Cl. 417-222.000.

Dietiker, Paul: *See*—
Buezis, John D.; and Dietiker, Paul, 4,621,658, Cl. 137-505.000.

Diffenderfer, Harold R.; and Rowley, George S., to Neapco, Inc. Telescoping tubes for torque transmission. 4,622,022, Cl. 464-162.000.

Diffracto Ltd.: *See*—
Pryor, Timothy R.; and Hageniers, Omer L., 4,621,664, Cl. 141-1.000.

Digital Equipment Corporation: *See*—
Boudreau, Ronald B.; and Termini, Charles F., 4,621,877, Cl. 312-257.00R.
Hearn, Patrick L.; Riggle, Charles M.; Parikh, Shyam C.; and Veseskis, Kenneth F., 4,622,516, Cl. 324-163.000.

Digital Recording Corporation: *See*—
West, John L.; and Russell, James T., 4,622,284, Cl. 430-290.000.

DiGiulio, Adolph V., to Atlantic Richfield Company. Process for producing modified styrenic polymer beads for high strength foamed articles. 4,622,346, Cl. 521-59.000.

Dil, Jan G.; and Bartsen, Johan W., to U.S. Philips Corporation. Method of manufacturing a semiconductor device comprising a silicon body, in which a sunken oxide layer is locally provided. 4,622,096, Cl. 156-643.000.

Dillard, Lathe T.; and Macho, Dale C., to Boeing Company, The. Inverted cutter. 4,621,957, Cl. 408-93.000.

Dimmitt, Clifford G.: *See*—
Angott, Paul G., 4,621,992, Cl. 417-572.000.

Dines, Steven: *See*—
Sfarti, Adrian; and Dines, Steven, 4,622,546, Cl. 340-748.000.

Dinkel, Emil: *See*—
Kaesling, Heinz; Dinkel, Emil; and Mann, Bernd, 4,621,784, Cl. 248-430.000.

Dinkel, Michael J.: *See*—
Blythe, James S.; Dinkel, Michael J.; and Stoltman, Donald D., 4,621,772, Cl. 239-585.000.

D'Intino, Joseph; Eckman, Carl E.; and Burgess, Lester E., to Standard Oil Company, The. Stabilized high solids, coal-oil mixtures and methods for the production thereof. 4,622,046, Cl. 44-51.000.

DiRegolo, Joseph A.; and Hauser, Hugo, to Tritec Industries, Inc. Self-sealing closure device. 4,621,743, Cl. 215-308.000.

Display-Design GmbH fur moderne Verkaufsforderungsmittel und Raumausstattung: *See*—
Lang, Franz J., 4,621,740, Cl. 211-133.000.

Ditcher, Eric: *See*—
Ditcher, Jack; Ditcher, Eric; and Westhoff, James A., 4,621,941, Cl. 404-26.000.

Ditcher, Jack; Ditcher, Eric; and Westhoff, James A., to A-Lok Products, Inc. Manhole riser having integral flexible waterlock for manhole covers and having a water tight seal for sealed manhole covers. 4,621,941, Cl. 404-26.000.

Ditgens, Klaus: *See*—
Lantzsch, Reinhard; Ditgens, Klaus; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, 4,622,333, Cl. 514-383.000.

Ditz, Marc W.: *See*—
Bially, Theodore; and Ditz, Marc W., 4,622,544, Cl. 340-636.000.

Diversified Drilling Services Ltd.: *See*—
Klyne, Albert A., 4,621,690, Cl. 166-241.000.

Di Vincenzo, Gregory T.: *See*—
Ciarcia, Ronald D.; Di Vincenzo, Gregory T.; Doughty, Dennis J.; and Bernier, Richard E., 4,622,530, Cl. 335-167.000.

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Embra, Maurice C., 4,621,785, Cl. 248-565.000.
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Transue, James A.; and Golden, Donald M., 4,621,639, Cl. 128-339.000.
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Ewing, Harry R. Metal boring tool. 4,621,958, Cl. 408-232.000.
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Lee, Kyu H.; and Porter, Christopher H., 4,622,140, Cl. 210-177.000.
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Kresge, Edward N.; and Hazelton, Donald R., 4,622,193, Cl. 264-141.000.
Young, Archie R.; Ho, Teh C.; Jacobson, Allan J.; and Chianelli, Russell R., 4,622,128, Cl. 208-18.000.
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Failes, Michael; and Mouroulis, Pantazis, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Fibre optic magnetic sensor. 4,622,460, Cl. 250-227.000.
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Fanuc Ltd.: *See*—
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Kishi, Hajimu; Seki, Masaki; Takegahara, Takashi; and Onishi, Yasushi, 4,621,959, Cl. 409-84.000.
Yamazaki, Etuo, 4,622,504, Cl. 318-561.000.

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Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; and Peyronel, Jean-Francois, to Rhone-Poulenc Industries. 3-vinyl-cephalosporins and their preparations. 4,622,393, Cl. 540-215.000.

Fass, Rudolf: *See—*
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Fatool, Francis; and Miller, William R., Jr., to Mil-Tool, Inc. Telescoping device with stop mechanism. 4,621,431, Cl. 33-161.000.

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Bernasconi, Christian; Faure, Alain; and Thibonnet, Bernard, 4,622,047, Cl. 44-62.000.

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Felix, Arthur M.; Heimer, Edgar P.; and Mowles, Thomas F., to Hoffmann-La Roche Inc. Growth hormone releasing factor analogs. 4,622,312, Cl. 514-12.000.

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Mooz, Dietrich, 4,622,443, Cl. 200-50.00R.

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Fishbein, Meyer. Surgical device for removing bone and tissue from joint members. 4,621,637, Cl. 128-305.000.

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Flannery, Brian P.: *See—*
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Soltis, Michael W., 4,621,833, Cl. 280-707.000.
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Fort Lock Corporation: *See—*
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Foster, Frank L., to Stanley Aviation Corporation. Self-locking, selectively releasable mechanism for locking structural parts together with load relieving retention. 4,621,840, Cl. 285-81.000.

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Chyung, Kenneth; Dwyer, Thomas J.; Foster, Gordon F.; Shoup, Robert D.; and Young, Roger A., 4,622,057, Cl. 65-18.100.

Foster, John A., to J. L. Clark Manufacturing Co. Tamper-evident container closure. 4,621,744, Cl. 220-270.000.

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Fouts, David P.; Gupta, Devandra; Ho, Paul S.; Jaspal, Jasvir S.; Lloyd, James R., Jr.; Oberschmidt, James M.; Srikrishnan, Kris V.; and Sullivan, Michael J., to International Business Machines Corporation. Electromigration lifetime increase of lead base alloys. 4,622,205, Cl. 420-566.000.

Frampton, Thomas J., to Diacon, Inc. Ceramic package system using low temperature sealing glasses. 4,622,433, Cl. 174-52.0FP.

Frank, Bernard; and Greenberg, Melvin B. Vaporizer and/or facial treatment device. 4,621,641, Cl. 128-368.000.

Frank, Steven J.; and Merritt, J. Scott, to Plexus Computers, Inc. Data processing system having a data coherence solution. 4,622,631, Cl. 364-200.000.

Franken, Harald: *See—*
Muller, Dietmar; Krohnert, Rudolf; and Franken, Harald, 4,622,000, Cl. 425-467.000.

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Dohmann, Fritz; Franz, Peter; Klaas, Friedrich; and Schulze, Gunter, 4,621,514, Cl. 72-354.000.

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Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.: *See—*
Muller, Dietmar; Krohnert, Rudolf; and Franken, Harald, 4,622,000, Cl. 425-467.000.

Frear, David L.: *See—*
Gallusser, David O.; and Frear, David L., 4,622,198, Cl. 264-318.000.
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Squires, John P.; Kronisch, Alan D.; Freeman, John J.; and Touchton, James J., 4,622,499, Cl. 318-254.000.

Fresch, Henry D.; and Hurt, Steven E., to Goodyear Tire & Rubber Company, The. Airspring with pneumatic fitting. 4,621,796, Cl. 267-64.280.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See—*
Pawelzik, Manfred, 4,621,659, Cl. 137-625.170.

Frito Lay, Inc.: *See—*
Ke, Victor H.; and Brown, Regina A., 4,622,226, Cl. 426-94.000.

Fritsch, Joseph F., to Ryan Plastics Ireland Limited. Cleaning apparatus for a disc drive. 4,622,617, Cl. 360-128.000.

Frosch, Franz, to Blendax-Werke R. Schneider. Preparation for oral hygiene. 4,622,220, Cl. 424-49.000.

Frund, Louis; and Baseggio, Marcello, to Atelier De Construction Steiger S.A. Knitting machine. 4,621,506, Cl. 66-75.100.

Fryen, Jurgen: *See—*
Boeck, Hans-Joachim; Fryen, Jurgen; and Meyer, Ulrich, 4,622,458, Cl. 250-203.00R.

Fuchigami, Takeshi: *See—*
Fukuhara, Yuichi; Mizutani, Hiroyuki; and Fuchigami, Takeshi, 4,621,707, Cl. 180-247.000.

Fudge, Kent D., to Atlantic Richfield Company. Expandable polypropylene interpolymer particles. 4,622,347, Cl. 521-81.000.

Fuhge, Peter: *See—*
Paques, Eric P.; and Fuhge, Peter, 4,621,631, Cl. 128-156.000.

Fuji Electric Co., Ltd.: *See—*
Kandatsu, Kiyoshi; Uchida, Naoshi; and Asahi, Nobuo, 4,622,444, Cl. 200-303.000.
Sukigara, Kunio; and Taniguchi, Harutaka, 4,622,464, Cl. 250-343.000.

Fuji Electric Corporate Research & Development Ltd.: *See—*
Sukigara, Kunio; and Taniguchi, Harutaka, 4,622,464, Cl. 250-343.000.

Fuji Fire-Proof Material Industry Co., Ltd.: *See—*
Matsuura, Sadaji; Ando, Satoru; and Kiso, Masamitsu, 4,622,071, Cl. 106-97.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Furuyama, Masaaki, 4,621,602, Cl. 123-425.000.

Fuji Photo Film Co., Ltd.: *See—*
Arai, Yoshihiro; and Shirahata, Ryuji, 4,622,271, Cl. 428-615.000.
Hirai, Hiroyuki; and Sato, Kozo, 4,622,289, Cl. 430-559.000.

Kondo, Syunichi; Horie, Seiji; Sato, Hideo; and Sano, Kenji, 4,622,278, Cl. 430-59.000.
Makino, Naonori; Kawamura, Kouichi; Horie, Seiji; and Sato, Hideo, 4,622,280, Cl. 430-70.000.
Noguchi, Masaru, 4,621,891, Cl. 350-6.200.
Ochiai, Takeji, 4,622,261, Cl. 428-195.000.
Oishi, Kengo; and Ono, Tuyoshi, 4,622,618, Cl. 360-133.000.
Takahashi, Yoshiaki, 4,621,920, Cl. 355-3.00R.
Umemoto, Makoto; and Aoki, Kozo, 4,622,287, Cl. 430-505.000.
Yokoyama, Shigeki; Yamanouchi, Junichi; Yoneyama, Masakazu; and Maekawa, Yukio, 4,622,288, Cl. 430-527.000.
Yuyama, Yasuaki; Kondo, Syunichi; and Sato, Hideo, 4,622,279, Cl. 430-66.000.

Fuji Seiki Machine Works, Ltd.: *See*—
Suzuki, Yasuhiro, 4,621,407, Cl. 29-568.000.

Fuji Xerox Co., Ltd.: *See*—
Hisatake, Masayuki; Moriguchi, Haruhiko; Inui, Toshiharu; and Noguchi, Akio, 4,622,595, Cl. 358-296.000.

Fujii, Akira: *See*—
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,621,914, Cl. 354-21.000.

Fujii, Setsuro; Unemi, Norio; and Takeda, Setsuo, to Taiho Pharmaceutical Company Limited. Anti-cancer composition for delivering 5-fluorouracil. 4,622,325, Cl. 514-274.000.

Fujii, Teruo: *See*—
Katsuyama, Mikizo; Fujii, Teruo; and Tanaka, Hirohisa, 4,622,591, Cl. 358-256.000.

Fujii, Yoshimasa: *See*—
Ishikawa, Haruo; and Fujii, Yoshimasa, 4,622,663, Cl. 370-3.000.

Fujimori, Hiroyoshi: *See*—
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,622,584, Cl. 358-98.000.

Fujioka, Futoshi: *See*—
Schreiber, William L.; Gillaspey, William D.; Fujioka, Futoshi; and Hanna, Marie R., 4,622,172, Cl. 252-522.00R.
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., 4,622,171, Cl. 252-522.00R.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, 4,622,318, Cl. 514-200.000.

Fujita, Kazunori, to Nissan Motor Co., Ltd. Automotive engine exhaust system. 4,621,494, Cl. 60-313.000.

Fujita, Tatsuo: *See*—
Suzuki, Shigeo; and Fujita, Tatsuo, 4,621,677, Cl. 165-135.000.

Fujitsu Limited: *See*—
Hino, Toshikatsu; Arase, Fumio; and Ohshima, Takashi, 4,621,419, Cl. 29-837.000.
Inoue, Minoru, 4,622,447, Cl. 219-10.55R.
Masuda, Shigefumi; and Iwama, Takeo, 4,621,925, Cl. 356-350.000.
Shimizu, Takafumi; and Tomizawa, Ichiro, 4,622,438, Cl. 379-63.000.
Taguchi, Masao, 4,622,570, Cl. 357-23.600.

Fujiwara, Koji; and Maeda, Yoshinobu, to Matsushita Electric Industrial Co., Ltd. Electronic component insertion apparatus. 4,621,406, Cl. 29-564.200.

Fukada, Shigeyuki: *See*—
Itoh, Ken; Tokura, Koichi; and Fukada, Shigeyuki, 4,622,664, Cl. 370-86.000.

Fukamachi, Rikuo. Electrically driven valve. 4,621,789, Cl. 251-129.120.

Fukuhara, Yuichi; Mizutani, Hiroyuki; and Fuchigami, Takeshi, to Aisin Seiki Kabushiki Kaisha. Control system for a four wheel drive vehicle. 4,621,707, Cl. 180-247.000.

Fukui Machinery Co. Ltd: *See*—
Hatanaka, Norio; Hata, Tsutae; Oketani, Yoshio; and Kimura, Eiji, 4,621,517, Cl. 72-441.000.

Fukui, Yutaka: *See*—
Mori, Takanobu; Kashimura, Tetsuo; Fukui, Yutaka; Yanai, Yoshimi; and Iizuka, Nobuyuki, 4,621,499, Cl. 60-752.000.

Fukumura, Sadaaki; Tagami, Etsuji; Hashimoto, Takeji; and Tano, Hirofumi, to Iwatsu Electric Co., Ltd.; and Dainippon Screen Mfg. Co., Ltd. Pen tip cleaning assembly of plotter. 4,621,428, Cl. 33-18.100.

Full, Gary G.: *See*—
Kupersmith, Bertram F.; Shull, Julian H.; Full, Gary G.; and Schienda, Gregory A., 4,622,551, Cl. 340-825.060.

Fulop, Ferenc: *See*—
Bernath, Gabor; Kobor, Jeno; Kalman, Alajos; Sohar, Pal; Fulop, Ferenc; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , 4,622,327, Cl. 514-294.000.

Fulton, Graham B.: *See*—
Zippa, Robert H.; Rynaski, Chester H.; and Fulton, Graham B., 4,621,979, Cl. 416-219.00R.

Funabashi, Kunio, to Honda Giken Kogyo Kabushiki Kaisha. Cooling system for motorcycle engine. 4,621,680, Cl. 165-44.000.

Funada, Fumiaki: *See*—
Kimura, Naofumi; Makagawa, Kenichi; Ishii, Yutaka; and Funada, Fumiaki, 4,622,162, Cl. 252-299.500.

Fung, Kwok K.: *See*—
Ibrahim, Fayez F.; and Fung, Kwok K., 4,621,502, Cl. 62-223.000.

Furukawa, Shunsuke; Hattori, Yoshitsugu; Matsumoto, Yoshihiko; and Okubo, Hiroshi, to Sony Corporation. Memory access control apparatus. 4,622,547, Cl. 340-750.000.

Furuno, Nobuo, to Nippon Paint Co., Ltd. Water-deionizing system. 4,622,133, Cl. 210-96.200.

Furushima, Teruhisa: *See*—
Yamamura, Takemi; Tokuse, Masahiro; and Furushima, Teruhisa, 4,622,270, Cl. 428-608.000.

Furutani, Shigeki: *See*—
Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,621,702, Cl. 180-140.000.

Furuyama, Masaaki, to Fuji Jukogyo Kabushiki Kaisha. Knock control system for automotive engines. 4,621,602, Cl. 123-425.000.

Fussell, David A., to Air Shot, Inc. Portable air pump. 4,621,984, Cl. 417-234.000.

Futaba Denshi Kogyo K.K.: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,622,236, Cl. 427-38.000.

G. D. Searle & Co.: *See*—
Baran, John S.; Lindberg, Thomas J.; and Lowrie, Harman S., 4,622,338, Cl. 514-460.000.

G. Siempelkamp GmbH & Co.: *See*—
Gerhardt, Klaus, 4,621,999, Cl. 425-371.000.

Gabilondo, Francisco L., to Goizper S. Coop. Planetary torque converter. 4,621,543, Cl. 74-805.000.

Gable, Stewart V.: *See*—
King, Francis G.; and Gable, Stewart V., 4,621,525, Cl. 73-117.000.

Gabrielli, Gino, to Automobiles Citroen; and Automobiles Peugeot. Sequential phase convertible machine. 4,621,408, Cl. 29-568.000.

Gagliardi, Richard: *See*—
Heymann, Mark S.; and Gagliardi, Richard, 4,621,739, Cl. 211-74.000.

Gagne, Pierre, to Rhone-Poulenc Industries. Process for the preparation of aqueous solutions of low molecular weight polyacrylic acids or their salts. 4,622,425, Cl. 562-595.000.

Gailey, Edward D., to S-P Manufacturing Corporation, The. Rotary hydraulic cylinder. 4,621,568, Cl. 92-106.000.

Gala Industries, Inc.: *See*—
Hundley, Raymond E., III, 4,621,996, Cl. 425-190.000.

Gallenkamp, Bernd: *See*—
Forster, Heinz; Gallenkamp, Bernd; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,622,415, Cl. 560-62.000.

Gallusser, David O.; and Frear, David L., to Allied Corporation. Method of making a coupling nut for an electrical connector having a molded anti-decoupling mechanism. 4,622,198, Cl. 264-318.000.

Gallusser, David O.: *See*—
Piscitelli, R. Amelia; Gallusser, David O.; Frear, David L.; Hemmer, Valentine J.; and Fischer, Charles P., 4,621,887, Cl. 339-276.00T.

Gammon, David L.: *See*—
Crevasse, Gary A.; Gammon, David L.; and Sullivan, Michael J., 4,621,482, Cl. 53-439.000.

Gandolf, Edward O.: *See*—
Johnson, John A.; Gandolf, Edward O.; and Hardy, Stephen N., 4,621,878, Cl. 312-257.00R.

Ganger, Jeffrey D., to Motorola, Inc. Slew rate limited driver circuit which minimizes crossover distortion. 4,622,482, Cl. 307-585.000.

Ganguly, Ashit K.; Sarre, Olga; and Girijavallabhan, Viyyoor M., to Schering Corporation. Substituted oligosaccharide antibiotics. 4,622,314, Cl. 514-54.000.

Garcia, Enrique, to Perkin-Elmer Corporation, The. Semiconductor chip with recessed bond pads. 4,622,574, Cl. 357-55.000.

Gardner, Christopher L.: *See*—
Matteau, Michel; Braun, Howard R.; and Gardner, Christopher L., 4,622,508, Cl. 320-13.000.

Garrett Corporation, The: *See*—
Denneny, James A., Jr.; and Rowland, Charles M., 4,621,767, Cl. 236-92.00R.
Gu, Alston L.; and Saville, Marshall P., 4,621,930, Cl. 384-105.000.

Gas Research Institute: *See*—
Pittard, Gerard T.; McDonald, William J.; Maurer, William C.; Cohen, John H.; and Givler, Gregory C., 4,621,698, Cl. 175-305.000.

Gea Luftkuhlergesellschaft Happel GmbH & Co.: *See*—
Sonnenschein, Hans; and Paikert, Paul, 4,622,183, Cl. 261-110.000.

Gebert, Karlheinz: *See*—
Streit, Werner; Bassing, Dieter; Gebert, Karlheinz; Klippel, Friedrich; and Leppert, Norbert, 4,622,037, Cl. 8-108.100.

Geipel, Henry J., Jr.: *See*—
Bakeman, Paul E., Jr.; and Geipel, Henry J., Jr., 4,622,573, Cl. 357-42.000.

Geist, Michael; and Ott, Gunther, to BASF Farben & Fasern AG. Self-crosslinking, heat-curable grinding resin. 4,622,117, Cl. 204-181.700.

Gellekink, Bernard; and Bisschop, Hilbert, to 501 Hollandse Signaalapparaten B.V. Pulse radar apparatus. 4,622,554, Cl. 342-67.000.

Gelles, David S.; Ghoniem, Nasr M.; and Powell, Roger W., to United States of America, Energy. Low activation ferritic alloys. 4,622,067, Cl. 420-61.000.

Gem Industries, Inc.: *See*—
Benoit, Roland, 4,621,395, Cl. 27-12.000.

Gendala, Christopher. Method and apparatus for inflating an article. 4,621,383, Cl. 5-454.000.

General Biologicals Corp.: *See*—
Ling, Chung-Mei, 4,622,076, Cl. 134-32.000.

General Electric Company: *See*—
Chang, Winston H.; Sprague, Robert A.; and Stahl, Joseph A., 4,622,079, Cl. 148-11.50F.
Ciarcia, Ronald D.; Di Vincenzo, Gregory T.; Doughty, Dennis J.; and Bernier, Richard E., 4,622,530, Cl. 335-167.000.
Elton, Richard K.; and Schultz, William R., Jr., 4,622,116, Cl. 204-181.100.
Flax, Stephen W., 4,621,645, Cl. 128-660.000.
Halstead, Richard J., 4,621,454, Cl. 49-386.000.
Liu, Ping Y., 4,622,359, Cl. 524-322.000.
Rosenquist, Niles R., 4,622,379, Cl. 528-176.000.
Stuart, Alan R., 4,621,978, Cl. 416-127.000.
Temple, Victor A. K., 4,622,572, Cl. 357-38.000.
Verbicky, John W., Jr.; and O'Neil, Elbridge A., 4,622,368, Cl. 525-426.000.
Woods, Lee O.; Hilty, Ronald L.; and Kornrumpf, William P., 4,621,503, Cl. 62-228.300.
Zinser, Richard L., 4,622,680, Cl. 375-25.000.
General Foods Corporation: *See*—
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., 4,622,417, Cl. 560-117.000.
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., 4,622,418, Cl. 560-117.000.
Saleeb, Fouad Z.; and McKay, Randal P., 4,622,227, Cl. 426-96.000.
Tu, Chia-Chi; Wauters, Ronald P.; and Kenyon, Ralph E., 4,622,225, Cl. 426-27.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,622,232, Cl. 426-548.000.
General Motors Corporation: *See*—
Blythe, James S.; Dinkel, Michael J.; and Stoltman, Donald D., 4,621,772, Cl. 239-585.000.
Kane, John P.; Cser, Daniel; and Dall, Robert H., 4,621,671, Cl. 157-1.100.
Matekunas, Frederic A., 4,621,603, Cl. 123-425.000.
Perring, John; and Watkinson, William J., 4,621,867, Cl. 297-341.000.
Straub, Robert D., 4,621,843, Cl. 285-356.000.
George Salter & Co. Ltd.: *See*—
Sanderson, Albert M.; Pearson, Arthur; and Bates, David A., 4,621,515, Cl. 72-403.000.
Georgopoulos, George; Toledo, Manuel; and Teran, Jorge, to Levolor Lorentzen, Inc. Venetian blind. 4,621,673, Cl. 160-168.00R.
Gerdes, Walter F., to Dow Chemical Company, The. Analyzer for water in gases by accumulate-desorb-inject method. 4,621,518, Cl. 73-29.000.
Gerhard Collardin GmbH: *See*—
Opitz, Reinhard; and Breuer, Manfred, 4,622,078, Cl. 148-6.15Z.
Gerhardt, Klaus, to G. Siempelkamp GmbH & Co. Belt-type press for making particleboard, fiberboard, and like pressedboard products. 4,621,999, Cl. 425-371.000.
Gerkin, Richard M.: *See*—
Gill, William A.; and Gerkin, Richard M., 4,622,361, Cl. 524-710.000.
Gerst, Louie H. Wind deflector and bug screen. 4,621,860, Cl. 296-91.000.
Ghoniem, Nasr M.: *See*—
Gelles, David S.; Ghoniem, Nasr M.; and Powell, Roger W., 4,622,067, Cl. 420-61.000.
Gibb, John F., to Backer Rod Manufacturing & Supply Co. Non-combustible filler rod for providing fire tight joint packing. 4,622,251, Cl. 428-36.000.
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; Schlicht, Heribert; and Schroer, Franz-Josef, to A. Monforts GmbH & Co. Convection dryer and/or fixing machine. 4,621,440, Cl. 34-155.000.
Giesecke, Henning: *See*—
Sirinyan, Kirkor; Giesecke, Henning; Wolf, Gerhard D.; Ebneth, Harold; and Merten, Rudolf, 4,622,411, Cl. 556-136.000.
Giles, Noah Y., Jr.: *See*—
Baxley, William H., Jr.; and Giles, Noah Y., Jr., 4,621,508, Cl. 68-198.000.
Gill, William A.; and Gerkin, Richard M., to Union Carbide Corporation. Flame retarded high modulus polyurethane elastomers and method of making same. 4,622,361, Cl. 524-710.000.
Gillaspey, William D.: *See*—
Schreiber, William L.; Gillaspey, William D.; Fujioka, Futoshi; and Hanna, Marie R., 4,622,172, Cl. 252-522.00R.
Gillery, F. Howard, to PPG Industries, Inc. Sputtered indium oxide films. 4,622,120, Cl. 204-192.260.
Gillette Company, The: *See*—
Jacobson, Chester F., 4,621,424, Cl. 30-41.000.
Gillois, Jean, to Chaudronnerie et Forges d'Alsace - C.E.F.A. Amphibious vehicle that can be used as an independent ferry and able to form a pontoon bridge. 4,621,385, Cl. 14-2.400.
Gindy, Sherif S., to Eaton Corporation. Tactile load sensing transducer. 4,621,533, Cl. 73-862.040.
Ginger, Edward A.: *See*—
Urban, Peter; and Ginger, Edward A., 4,622,213, Cl. 423-242.000.
Giraudon, Raymond; and Santini, Georges, to Rhone-Poulenc Agrochimie. Fungicidal 2-cyanobenzimidazole derivatives. 4,622,323, Cl. 514-228.000.
Girijavallabhan, Viyyoor M.: *See*—
Ganguly, Ashit K.; Sarre, Olga; and Girijavallabhan, Viyyoor M., 4,622,314, Cl. 514-54.000.
Gitman, Grigory M., to American Combustion, Inc. Variable heat generating method and apparatus. 4,622,007, Cl. 432-13.000.
Givler, Gregory C.: *See*—
Pittard, Gerard T.; McDonald, William J.; Maurer, William C.; Cohen, John H.; and Givler, Gregory C., 4,621,698, Cl. 175-305.000.
Glaser, David M.: *See*—
Jacobine, Anthony F.; and Glaser, David M., 4,622,348, Cl. 522-27.000.
Glass, Alastair M.; Kohl, Paul A.; Lum, Richard M.; and Ostermayer, Frederick W., Jr., to AT&T Bell Laboratories. Process of producing devices with photoelectrochemically produced gratings. 4,622,114, Cl. 204-129.300.
Glatt GmbH: *See*—
Grande, Robert; de Kluizenaar, Cornelis J.; Naunapper, Dietmar C.; and Wehrle, Karlheinz J., 4,621,437, Cl. 34-10.000.
Gleason Works, The: *See*—
Kitchen, Richard L.; and Blakesley, Richard C., 4,621,954, Cl. 407-22.000.
Glennon, Timothy F., to Sundstrand Corporation. Power supply system with improved transient response. 4,622,629, Cl. 363-70.000.
Glitsch, Inc.: *See*—
McClain, Robert W., 4,621,475, Cl. 52-693.000.
Go-Jo Industries: *See*—
Kanfer, Joseph S., 4,621,749, Cl. 222-153.000.
Godino, Rino L.; and DeBiase, Robert R., to Foster Wheeler Energy Corporation. Fractionator having reduced product vapor condensation in the flash zone. 4,621,724, Cl. 196-139.000.
Godsay, Madhu P.; Hull, Michael N.; and Yasnovsky, Vacheslav M., to International Paper Company. Process for the delignification of lignocellulosic material with oxygen, ferricyanide, and a protector. 4,622,100, Cl. 162-65.000.
Goerens, Robert L., to Uniroyal Englebert Textilcord S.A. Method and apparatus for generating an electrostatic field for flocking a thread-like or yarn-like material, and the flocked article thus produced. 4,622,235, Cl. 427-25.000.
Goizper S. Coop.: *See*—
Gabilondo, Francisco L., 4,621,543, Cl. 74-805.000.
Gold, Raymond; and McElroy, William N., to United States of America, Energy. Non-destructive method for determining neutron exposure and constituent concentrations of a body. 4,622,200, Cl. 376-159.000.
Golden, Donald M.: *See*—
Transue, James A.; and Golden, Donald M., 4,621,639, Cl. 128-339.000.
Golden, Frederick L., to Lipson, Eric B. Vertical-walled edge-connected panelized connectable rhombic triacontahedral buildings. 4,621,467, Cl. 52-81.000.
Goldman, Joel, to AT&T Bell Laboratories. Multi-channel data signal combining arrangement. 4,622,519, Cl. 328-137.000.
Golino, Carlo M.: *See*—
Barnhart, Kenneth T.; Golino, Carlo M.; and Quinn, Candace J., 4,622,184, Cl. 264-1.100.
Gomi, Tadashi; Sakata, Kenji; Aoyama, Ichiro; and Sono, Nobuo, to Yuho Chemicals Inc.; and Mitsui Toatsu Chemical Inc. Coating composition. 4,622,360, Cl. 524-507.000.
Goodrum, Richard W., to Ethyl Corporation. Porous film and absorptive structure. 4,622,036, Cl. 604-367.000.
Goodyear Tire & Rubber Company, The: *See*—
Calevich, Robert; and Chinchar, George V., 4,621,773, Cl. 241-21.000.
Fresch, Henry D.; and Hurt, Steven E., 4,621,796, Cl. 267-64.280.
Strader, Don S., 4,621,727, Cl. 198-810.000.
Gorman-Rupp Company, The: *See*—
Forsythe, Carl; Dorminy, Jon L.; and Raymon, Joseph W., 4,621,990, Cl. 417-395.000.
Gorzinski, Manfred: *See*—
Fischer, Herbert; Wegemund, Bernd; Gorzinski, Manfred; and Gress, Wolfgang, 4,622,382, Cl. 528-295.300.
Gosik, Curtis J.: *See*—
Krause, Robert F.; and Gosik, Curtis J., 4,621,416, Cl. 29-606.000.
Gosselink, Eugene P., to Procter & Gamble Company, The. Zwitterionic polymers having clay soil removal/anti-redeposition properties useful in detergent compositions. 4,622,378, Cl. 528-66.000.
Gossmann, Willi; Pape, Gebhard; Klupfel, Norbert; and Stark, Josef, to SKF Kugellagerfabriken GmbH. Apparatus and method for assembling universal joints. 4,621,402, Cl. 29-407.000.
Goto, Toshio: *See*—
Saito, Junichi; Kurahashi, Yoshio; Goto, Toshio; and Yamaguchi, Naoko, 4,622,064, Cl. 71-92.000.
Gouali, Mohamed, to Lignes Telegraphiques et Telephoniques L.T.T. A device for distributing light energy including at least one inlet fiber with a chamfered outlet end and a diffraction grating, and application thereof to optical switching. 4,621,894, Cl. 350-96.190.
Grace, Robert W. Mechanized carton picker. 4,621,745, Cl. 221-75.000.
Graco Inc.: *See*—
Larson, James H., 4,621,975, Cl. 415-111.000.
Grain Processing Corporation: *See*—
Harvey, Richard D.; and Witt, Paul R., 4,622,299, Cl. 435-96.000.
Grande, Robert; de Kluizenaar, Cornelis J.; Naunapper, Dietmar C.; and Wehrle, Karlheinz J., to Duphar International Research B.V.; and Glatt GmbH. Method and apparatus for drying a solid material wetted with a solvent or solvent mixture. 4,621,437, Cl. 34-10.000.
Granger, Maurice. Device for dispensing and simultaneously cutting rolled up materials in webs. 4,621,755, Cl. 225-96.000.
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Salem, Eli; Muller, Raymond J.; and Stracey, Stanley T., 4,622,141, Cl. 210-189.000.

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Gray, Gary M., to J. T. Baker Chemical Company. Deep ultra-violet lithographic resist composition and process of using. 4,622,283, Cl. 430-191.000.

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Shih, Cheng-Chung; and Gray, Paul R., 4,622,536, Cl. 340-347.0DA.

Grazier, Edwin C.: *See*—
Dancker, Gregory A.; and Grazier, Edwin C., 4,622,668, Cl. 371-20.000.

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Greenlee, Wilfred E. Camera mount and photographers seat. 4,621,786, Cl. 354-74.000.

Gregori, Armando: *See*—
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Greiner, Waldemar H., to Ductlok, Inc. Method and apparatus for stiffening sections and a mechanical joint for use therewith. 4,621,661, Cl. 138-172.000.

Gress, Wolfgang: *See*—
Fischer, Herbert; Wegemund, Bernd; Gorzinski, Manfred; and Gress, Wolfgang, 4,622,382, Cl. 528-295.300.

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Knifton, John F.; and Grice, Neal J., 4,622,343, Cl. 518-700.000.

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Babb, Richard C.; and Griffin, Tommy K., 4,621,403, Cl. 29-433.000.

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Bueb, Michael; Paulini, Dieter; Muschelknautz, Edgar; Wagner, Wolfram; and Groschel, Herbert, 4,622,195, Cl. 264-168.000.

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Reimer, William A., 4,621,876, Cl. 312-250.000.

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Leung, Chi H.; and DeNuccio, Ron J., 4,622,269, Cl. 428-550.000.
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McKoy, Vincent; and Gupta, Amitave, 4,622,174, Cl. 252-582.000.

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Gustafsson, Jan. Vehicle theft-preventing device acting on the brake system. 4,621,874, Cl. 303-89.000.

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Klocke, Harald, 4,621,660, Cl. 137-625.440.

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Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,622,250, Cl. 428-35.000.

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Pryor, Timothy R.; and Hageniers, Omer L., 4,621,664, Cl. 141-1.000.

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Hagmann, William K., to Merck & Co., Inc. Resolution of racemic derivatives of 5-(1-methyl-5-methylthiopyrrol-2-oyl)-1,2-dihydro-3H-pyrrolo[1,2-a]pyrrole-2-carboxylic acid and analogs. 4,622,407, Cl. 548-453.000.

Hahn, Granville J.; Rutledge, Raleigh N.; Searl, Alonzo H.; and Sommerman, Walter E., to Cosden Technology, Inc. Heat exchanger apparatus for extruding thermoplastic compositions. 4,621,678, Cl. 165-27.000.

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Bernath, Gabor; Kobor, Jeno ; Lazar, Janos; Motika, Gabor; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , 4,622,329, Cl. 514-307.000.

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Watanabe, Hideo; Kawasaki, Kanjiro; Kubo, Keishi; Hakiri, Minoru; and Takigawa, Nobuhiro, 4,622,565, Cl. 346-201.000.

Haley, Tim O.: *See*—
Bouge, Harry A.; and Haley, Tim O., 4,622,459, Cl. 250-214.00A.

Hall, Robert E.: *See*—
Whynacht, Charles; and Hall, Robert E., 4,622,538, Cl. 340-506.000.

Halliburton Company: *See*—
Harris, Lawrence E.; Holtmyer, Marlin D.; and Pauls, Richard W., 4,622,155, Cl. 252-8.551.
Walker, Jerry L.; Crummett, Donald L.; and Behling, William C., 4,621,396, Cl. 29-1.300.

Halstead, Richard J., to General Electric Company. Mechanism for controllably opening and closing appliance door or panel. 4,621,454, Cl. 49-386.000.

Hamada, Eiichi: *See*—
Watanabe, Hiroyuki; Hamada, Eiichi; Hayashi, Motomu; and Ono, Kenji, 4,621,453, Cl. 49-374.000.

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Hamanishi, Yoshinari, to Nippon Kogaku K.K. Photographic lens of a great aperture ratio. 4,621,909, Cl. 350-464.000.

Hamilton, Alfred S.: *See*—
Bohannon, William D., Jr.; Brent, Herbert E.; Hamilton, Alfred S.; and Kinard, Michael D., 4,622,092, Cl. 156-461.000.

Hamilton, Steve: *See*—
Vora, Chandra R.; Ziegler, Michael L.; Bagula, Mark; and Hamilton, Steve, 4,622,630, Cl. 364-134.000.

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Hampton, Leonard; and Hohulin, Samuel E., to National Union Electric Corporation. Vacuum cleaner assembly. 4,621,390, Cl. 15-351.000.

Hanada, Toshiro: *See*—
Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,622,296, Cl. 435-26.000.

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Hanes, Ronnie M.; and Baugh, William D., to National Distillers and Chemical Corporation. Carbonylation of allylic ethers to esters. 4,622,416, Cl. 560-114.000.

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Hanna, Marie R.: *See*—
Schreiber, William L.; Gillaspey, William D.; Fujioka, Futoshi; and Hanna, Marie R., 4,622,172, Cl. 252-522.00R.
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., 4,622,171, Cl. 252-522.00R.

Hansen, John B.: *See*—
Watjen, Frank; Engelstoft, Mogens; Hansen, John B.; and Jensen, Leif H., 4,622,320, Cl. 514-220.000.
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Hansen, Per K., to Position Orientation Systems, Ltd. Magnetic position and orientation measurement system. 4,622,644, Cl. 364-559.000.
Hansson, John N.; and Johns, Herbert L., to Corning Glass Works. Zirconia pen balls. 4,621,936, Cl. 401-215.000.
Hara, Hiroari: *See*—
Tsuchida, Seiichi; Kodama, Yoshihiro; and Hara, Hiroari, 4,622,357, Cl. 524-270.000.
Hara, Toshio, to Nippon Electric Co., Ltd. CMOS integrated circuit device. 4,622,571, Cl. 357-42.000.
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Harbridge, John B., to Beecham Group p.l.c. 9-deoxy-9-isocyanato clavulante intermediates. 4,622,177, Cl. 540-348.000.
Hardmark, Ragnar, to Onspot AB. Anti-skid device for motor vehicles. 4,621,712, Cl. 188-4.00B.
Hardy, Stephen N.: *See*—
Johnson, John A.; Gandolf, Edward O.; and Hardy, Stephen N., 4,621,878, Cl. 312-257.00R.
Harig, Egon H. A.; and Martens, Gerd H., to U.S. Philips Corporation. Arrangement for determining the presence of specific substances in a liquid. 4,622,465, Cl. 250-373.000.
Harms, Wolfgang; Wunderlich, Klaus; and Jager, Horst, to Bayer Aktiengesellschaft. Triphendioxazine dyestuffs. 4,622,396, Cl. 544-76.000.
Harnischfeger Corporation: *See*—
Rathi, Ram N., 4,621,742, Cl. 212-177.000.
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Casals-Stenzel, Jorge; Weber, Karl-Heinz; Walther, Gerhard; Harreus, Albrecht; and Muacevic, Gojko, 4,622,319, Cl. 514-220.000.
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Koeneman, James B., 4,621,629, Cl. 128-92.0YS.
Harris, Charles C. Package for horticultural items. 4,621,733, Cl. 206-423.000.
Harris, James J.: *See*—
Kesling, Haven S., Jr.; and Harris, James J., 4,622,345, Cl. 521-57.000.
Harris, Lawrence E.; Holtmyer, Marlin D.; and Pauls, Richard W., to Halliburton Company. Method for fracturing subterranean formations. 4,622,155, Cl. 252-8.551.
Harris, Sherwood. Shellfish cultivator. 4,621,588, Cl. 119-4.000.
Harrod, Jimmie A.: *See*—
Soltysiak, John R.; and Harrod, Jimmie A., 4,621,556, Cl. 83-670.000.
Hartman, H. David: *See*—
Hartman, Steven D.; and Hartman, H. David, 4,621,956, Cl. 408-1.00R.
Hartman, Steven D.; and Hartman, H. David. Method and apparatus for cutting of flexible foam material. 4,621,956, Cl. 408-1.00R.
Hartmann, Wilfried, to Hebel GmbH Holding. Apparatus for cutting a porous concrete block which is still in a plastic condition. 4,621,555, Cl. 83-620.000.
Harvey, Richard D.; and Witt, Paul R., to Grain Processing Corporation. Production of high D.E. syrups. 4,622,299, Cl. 435-96.000.
Haschke, Paul C. Method of making surgical cast with window. 4,621,626, Cl. 128-91.00R.
Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control method for internal combustion engines at fuel cut operation. 4,621,600, Cl. 123-357.000.
Hashimoto, Akihiko; Shirai, Hitoshi; and Shiratori, Kazutoshi, to Olympus Optical. Auto-focus zoom lens assembly. 4,621,906, Cl. 350-429.000.
Hashimoto, Shunichi: *See*—
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Hashimoto, Takeji: *See*—
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Hashimoto, Yasuichi; and Ogawa, Tomihisa, to Kabushiki Kaisha Toshiba. Magnetic head controlling apparatus. 4,622,604, Cl. 360-78.000.
Hashizume, Yoshiki, to Toyo Aluminium Kabushiki Kaisha. Metal powder pigment. 4,622,073, Cl. 106-290.000.
Hata, Tsutae: *See*—
Hatanaka, Norio; Hata, Tsutae; Oketani, Yoshio; and Kimura, Eiji, 4,621,517, Cl. 72-441.000.
Hatanai, Takashi: *See*—
Nakashima, Keishi; Hatanai, Takashi; and Mukasa, Koichi, 4,622,273, Cl. 428-668.000.
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Hatano, Masahiro: *See*—
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Hatchman, Robert A. Eyeshield. 4,621,378, Cl. 2-9.000.
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Hattori, Ryuichi: *See*—
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Havemann, Robert H.; and Porter, Vernon R., to Texas Instruments Incorporated. Laser-enhanced drive in of source and drain diffusions. 4,621,411, Cl. 29-571.000.
Hayashi, Masaharu: *See*—
Takeuchi, Tetsuya; Koshigoe, Katsuki; Ogino, Hiroshi; and Hayashi, Masaharu, 4,621,433, Cl. 33-286.000.
Hayashi, Motomu: *See*—
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Hayduk, Edward A.: *See*—
Yext, Walter F.; Hayduk, Edward A.; and Fisher, Clark K., 4,622,240, Cl. 427-96.000.
Hayes, Richmond S., Jr.: *See*—
Jennings, William B.; Kozlowski, Robert M.; and Hayes, Richmond S., Jr., 4,621,682, Cl. 165-76.000.
Haynes, Duncan H. Method of inducing local anesthesia using microdroplets of a general anesthetic. 4,622,219, Cl. 424-38.000.
Hazel, Robert L.; and Chan, Gilbert Y., to Burroughs Corporation. Focus detection and control apparatus for maintaining accurate focusing in an optical memory system by detecting reflected beam diameter variations at spaced predetermined locations. 4,622,659, Cl. 369-45.000.
Hazelett Strip-Casting Corporation: *See*—
Vanelderen, Yvon L.; Raskin, Christian L. G.; Mortier, Rene E. J.; and Dompas, John M. A., 4,621,675, Cl. 164-481.000.
Hazelton, Donald R.: *See*—
Kresge, Edward N.; and Hazelton, Donald R., 4,622,193, Cl. 264-141.000.
Head, Donald L.; Wright, Richard F.; and Saccocio, Edward J., to Mead Corporation, The. Photographic method for forming images on plain paper. 4,622,282, Cl. 430-138.000.
Health Research Inc. (Roswell Park Division): *See*—
Hong, Chung I.; and West, Charles R., 4,622,392, Cl. 536-29.000.
Hearn, Patrick L.; Riggle, Charles M.; Parikh, Shyam C.; and Veseskis, Kenneth F., to Digital Equipment Corporation. Magnetic tachometer for disk drives. 4,622,516, Cl. 324-163.000.
Heath, Wilbur G.; and Casey, Robert B., to Barcroft Company. Low viscosity aluminum hydroxy carbonate gel process. 4,622,167, Cl. 252-315.700.
Hebel GmbH Holding: *See*—
Hartmann, Wilfried, 4,621,555, Cl. 83-620.000.
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Hedrick, Dennis R.: *See*—
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Hedstrom Corporation: *See*—
Ziegler, William H., Jr., 4,621,826, Cl. 280-259.000.
Heidelberger Druckmaschinen AG: *See*—
Jeschke, Willi, 4,621,575, Cl. 101-217.000.
Wirz, Arno, 4,621,576, Cl. 101-230.000.
Heijnen, Johan; and Bakx, Martinus, to Mead Corporation, The. Top-gripping carrier with interlocked panels. 4,621,734, Cl. 206-427.000.
Heikkila, Risto M.: *See*—
Tuovinen, Heikki; Rinne, Kauko K.; Honkaniemi, Matti; Heikkila, Risto M.; and Jankkila, Martti, 4,622,677, Cl. 373-101.000.
Heimer, Edgar P.: *See*—
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Heitzig, Jurgen: *See*—
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Hemmer, Valentine J.: *See*—
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Hemorrhoid Clinic of America: *See*—
Ali, Max, 4,621,635, Cl. 128-303.100.
Henkel Kommanditgesellschaft auf Aktien: *See*—
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Schmid, Karl; Schindler, Joachim; and Asbeck, Adolf, 4,622,303, Cl. 435-243.000.
Henning, Paul-Georg: *See*—
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Hennix i Stockholm AB: *See*—
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Hentschel, Volker, to Hochtief Ag Vorm. Gebruder Helfmann. Tunnel lining form. 4,621,948, Cl. 405-146.000.
Hergenrother, Paul M.; and Jensen, Brian J., to United States of America, National Aeronautics and Space Administration. 5-(4-ethynylophenoxy)isophthalic chloride. 4,622,182, Cl. 260-544.00P.
Hermanns, Heinrich: *See*—
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; Schlicht, Heribert; and Schroer, Franz-Josef, 4,621,440, Cl. 34-155.000.

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Herndon, William H.: *See*—
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Herrera, Fernando Q. Demountable patio furniture. 4,621,865, Cl. 297-157.000.
Heymann, Mark S.; and Gagliardi, Richard. Tray for glass racks. 4,621,739, Cl. 211-74.000.
Higginbotham, Alan V. Sill attachment underframe measurement system. 4,621,435, Cl. 33-520.000.
Higuchi, Shigemitsu: *See*—
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Higurashi, Seiji: *See*—
Hirota, Akira; and Higurashi, Seiji, 4,622,597, Cl. 358-343.000.
Hijuelos, Humberto A.: *See*—
Qureshi, Gulzar A.; Morrison, Daniel P.; Hijuelos, Humberto A.; and Vollmuth, Lawrence P., 4,621,399, Cl. 29-33.00D.
Hill, Alfred, to AEPLC. Scraper rings. 4,621,386, Cl. 15-104.01R.
Hill, Alfred D., to Board of Regents, University of Texas System. Two-pulse tracer ejection method for determining injection profiles in wells. 4,622,463, Cl. 250-259.000.
Hill, Kevin E., to Milsco Manufacturing Company. Tiltable arm rest assembly and mounting and operating means therefor. 4,621,864, Cl. 297-115.000.
Hill, Ronald F., to Bartron Corporation. Grass paving structure. 4,621,942, Cl. 404-41.000.
Hillyard, Derek W.: *See*—
Cook, Peter H.; and Hillyard, Derek W., 4,621,405, Cl. 29-48.50R.
Hiltebrand, Peter; Ruf, Arthur; Laederach, H. E.; and Gschwend, K. Method and device for ozonization of a fluid. 4,622,151, Cl. 210-739.000.
Hilty, Ronald L.: *See*—
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Himuro, Masami: *See*—
Murano, Kanji; Nishigaki, Susumu; Himuro, Masami; and Watanabe, Yoshihisa, 4,621,903, Cl. 350-390.000.
Hinch, George R.: *See*—
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Hindley, Richard M.: *See*—
Cantello, Barrie C. C.; and Hindley, Richard M., 4,622,342, Cl. 514-653.000.
Hino, Toshikatsu; Arase, Fumio; and Ohshima, Takashi, to Fujitsu Limited. Automatic IC mounting process and apparatus for performing the process. 4,621,419, Cl. 29-837.000.
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Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, 4,622,268, Cl. 428-480.000.
Hinshaw, Robert L., to Boeing Company, The. Dust collection apparatus. 4,621,462, Cl. 51-273.000.
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Hirata, Hirokazu: *See*—
Kasamatsu, Norikazu; Matsukawa, Masao; Hirata, Hirokazu; and Mishima, Masaru, 4,622,566, Cl. 346-214.000.
Hirayama, Takahisa: *See*—
Ito, Sukenori; Take, Yoshiaki; and Hirayama, Takahisa, 4,622,026, Cl. 493-104.000.
Hirobe, Junichi: *See*—
Ishida, Hiroshi; Hirobe, Junichi; Tomi, Toshikazu; and Taniguchi, Masami, 4,621,802, Cl. 271-272.000.
Hirobe, Kiyokazu; and Tsujii, Naokuni, to Mitsubishi Plastics Industries Limited. Heat shrinkable tube of polyvinyl chloride for protecting stem of cut flowers. 4,621,450, Cl. 47-58.000.
Hiroi, Kazuo, to Kabushiki Kaisha Toshiba. Mixture control apparatus and mixture control method. 4,621,927, Cl. 366-132.000.
Hirota, Akira; and Higurashi, Seiji, to Victor Company of Japan, Limited. Sound and video multiplex recording system. 4,622,597, Cl. 358-343.000.
Hirschberg, Eugene H.; and Horecky, Carl J., to Standard Oil Company (Indiana). Sulfur oxide and particulate removal system. 4,622,210, Cl. 422-144.000.
Hirschberger, Michael, to Owens-Illinois, Inc. Process for extruding high molecular weight, high density linear ethylene polymers to form heavy tubular members. 4,622,199, Cl. 264-514.000.
Hirschmann, Karl-Heinz, to Hofler, Willy. Multiple-coordinate scanner with regulated scanning force. 4,621,434, Cl. 33-503.000.
Hirth, Hans: *See*—
Senft, Ernst; Hirth, Hans; and Klemmer, Herbert, 4,621,538, Cl. 74-512.000.
Hisatake, Masayuki; Moriguchi, Haruhiko; Inui, Toshiharu; and Noguchi, Akio, to Fuji Xerox Co., Ltd. Image display unit capable of tone reproduction. 4,622,595, Cl. 358-296.000.
Hitachi Engineering Co., Ltd.: *See*—
Noguchi, Yoshiki; Arakawa, Tadao; Nagasaki, Nobuo; Sugita, Shigehisa; and Takeuchi, Masato, 4,622,275, Cl. 429-19.000.
Hitachi Koki Co., Ltd.: *See*—
Kataoka, Keiji, 4,621,892, Cl. 350-6.300.
Hitachi, Ltd.: *See*—
Hosoe, Yuzuru; Ohta, Norio; Andoo, Keikichi; and Sugita, Yutaka, 4,622,264, Cl. 428-332.000.
Izumida, Yukihiro; Majima, Kazuo; Komoro, Hidemasa; Horiuchi, Masakatsu; and Ikeda, Mamoru, 4,622,491, Cl. 313-414.000.
Kaku, Toshimitsu; Nakao, Takeshi; and Tsunoda, Yoshito, 4,622,564, Cl. 346-160.000.
Kataoka, Keiji, 4,621,892, Cl. 350-6.300.
Miyashita, Tsune; Yasuda, Makoto; Murayama, Seiichi; and Arai, Yoji, 4,622,485, Cl. 313-25.000.
Mizunuma, Sinji; Sunada, Masayoshi; and Higuchi, Shigemitsu, 4,622,603, Cl. 360-78.000.
Mori, Takanobu; Kashimura, Tetsuo; Fukui, Yutaka; Yanai, Yoshimi; and Iizuka, Nobuyuki, 4,621,499, Cl. 60-752.000.
Murasaki, Shigeru; Hattori, Motonobu; Ishibashi, Akira; and Nandoh, Kenji, 4,622,628, Cl. 363-37.000.
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Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, 4,622,600, Cl. 360-32.000.
Otsubo, Toru, 4,622,094, Cl. 156-627.000.
Oyama, Yoshishige; Kirisawa, Tadashi; and Osuga, Minoru, 4,622,125, Cl. 204-406.000.
Takagi, Atsushi; Izumi, Shige[illegible]ahashi, Fuminobu; Sato, Chikara; Naitoh, Shinji; and [illegible]onoda, Shinji, 4,621,532, Cl. 73-623.000.
Tamata, Shin; and Horiuchi, Susumu, 4,622,175, Cl. 252-628.000.
Yamada, Izumi; Yamamoto, Hajime; and Tsunashima, Mikiyasu, 4,622,202, Cl. 376-246.000.
Yasuda, Makoto; and Murayama, Seiichi, 4,622,493, Cl. 313-642.000.
Ho, Fahfu: *See*—
Grobman, Warren D.; Ho, Fahfu; Hurst, Jerry E., Jr.; Ritsko, John J.; and Tomkiewicz, Yaffa, 4,622,095, Cl. 156-635.000.
Ho, Kenton T. T.: *See*—
Basham, Jack K.; Ho, Kenton T. T.; and Mrozek, Eric M., 4,622,683, Cl. 375-90.000.
Ho, Paul S.: *See*—
Fouts, David P.; Gupta, Devandra; Ho, Paul S.; Jaspal, Jasvir S.; Lloyd, James R., Jr.; Oberschmidt, James M.; Srikrishman, Kris V.; and Sullivan, Michael J., 4,622,205, Cl. 420-566.000.
Ho, Teh C.: *See*—
Young, Archie R.; Ho, Teh C.; Jacobson, Allan J.; and Chianelli, Russell R., 4,622,128, Cl. 208-18.000.
Hobrough, Gilbert L. Stereophonic sound system. 4,622,689, Cl. 381-24.000.
Hochtief Ag Vorm. Gebruder Helfmann: *See*—
Hentschel, Volker, 4,621,948, Cl. 405-146.000.
Hochtief Aktiengesellschaft: *See*—
Babendererde, Siegmund; and Lah, Gunnar, 4,621,947, Cl. 405-146.000.
Hockaday, David C.: *See*—
Bright, Stephen A.; Brun, Philip L.; Bercot, Mark C.; Beres, Larry A.; Brackney, Jerry A.; Bright, Timothy L.; Hockaday, David C.; and Patrick, Jeffrey L., 4,622,001, Cl. 425-549.000.
Hoda, Takeo: *See*—
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,621,914, Cl. 354-21.000.
Hoechst Aktiengesellschaft: *See*—
Bormuth, Horst, 4,622,002, Cl. 425-577.000.
Meininger, Fritz; Hoyer, Ernst; Otten, Joachim W., deceased; Otten, Ursula, heir; Rudolph nee Otten, Anna G., heir; and Fass, Rudolf, 4,622,390, Cl. 534-634.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Shutske, Gregory M., 4,622,326, Cl. 514-293.000.
Hoffman, Harry S., Jr.: *See*—
Criscimagna, Tony N.; Hoffman, Harry S., Jr.; and Milich, Thomas J., 4,622,549, Cl. 340-805.000.
Hoffman, William C.: *See*—
Bastow, Francis M.; and Hoffman, William C., 4,621,799, Cl. 271-10.000.
Hoffmann-La Roche Inc.: *See*—
Felix, Arthur M.; Heimer, Edgar P.; and Mowles, Thomas F., 4,622,312, Cl. 514-12.000.
Petrzilka, Martin; and Schadt, Martin, 4,621,901, Cl. 350-350.00R.
Hofland, Jurjen P.: *See*—
Cornelissens, Emery G. P.; Hofland, Jurjen P.; and Mets, Lambertus C., 4,622,161, Cl. 252-90.000.
Hofler, Willy: *See*—
Hirschmann, Karl-Heinz, 4,621,434, Cl. 33-503.000.
Hohne, Paul, to Ipsen Industries International Gesellschaft mit beschrankter Haftung. Method and apparatus for heat treating metallic workpieces using a continuous-heating furnace or gravity-discharge furnace. 4,622,006, Cl. 432-11.000.
Hobulin, Samuel E.: *See*—
Hampton, Leonard; and Hobulin, Samuel E., 4,621,390, Cl. 15-351.000.
Holloway, Gerald C., Jr.: *See*—
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,622,023, Cl. 474-93.000.

Holmwood, Graham: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Reinecke, Paul; and Brandes, Wilhelm, 4,622,335, Cl. 514-383.000.
Holter, John W. Attitude and pressure responsive valve. 4,621,654, Cl. 137-38.000.
Holtmyer, Marlin D.: *See—*
Harris, Lawrence E.; Holtmyer, Marlin D.; and Pauls, Richard W., 4,622,155, Cl. 252-8.551.
Homma, Koji: *See—*
Ikuta, Shiro; and Homma, Koji, 4,621,687, Cl. 165-152.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Baba, Masayoshi, 4,622,622, Cl. 362-65.000.
Funabashi, Kunio, 4,621,680, Cl. 165-44.000.
Hasegawa, Shumpei, 4,621,600, Cl. 123-357.000.
Kawada, Keiichi; Okuyama, Takahiro; and Toki, Susumu, 4,621,597, Cl. 123-90.270.
Sano, Shoichi, 4,621,823, Cl. 280-91.000.
Honda Giken Kogyo Kabushiki Kaiska: *See—*
Miura, Seishi, 4,621,598, Cl. 123-90.460.
Honeywell Inc.: *See—*
Buezis, John D.; and Dietiker, Paul, 4,621,658, Cl. 137-505.000.
Buss, Leonard A.; Loeb, Phillip J.; and Prysby, Daniel G., 4,622,539, Cl. 340-506.000.
Everson, Jeffrey H., 4,622,515, Cl. 324-158.00D.
Hong, Chung I.; and West, Charles R., to Health Research Inc. (Roswell Park Division). Thiophospholipid conjugates of antitumor agents. 4,622,392, Cl. 536-29.000.
Honjo Chemical Kabushiki Kaisha: *See—*
Kobayashi, Masao; Ishida, Nobuyuki; and Toyoda, Yoshihiro, 4,621,985, Cl. 417-250.000.
Honjo, Takeshi; Kitahara, Makoto; Suzuki, Yasumichi; and Takahata, Naomi, to Canon Kabushiki Kaisha. Image recording apparatus. 4,622,594, Cl. 358-293.000.
Honjo, Takeshi: *See—*
Takahata, Naomi; and Honjo, Takeshi, 4,621,921, Cl. 355-14.0SH.
Honkaniemi, Matti: *See—*
Tuovinen, Heikki; Rinne, Kauko K.; Honkaniemi, Matti; Heikkila, Risto M.; and Jankkila, Martti, 4,622,677, Cl. 373-101.000.
Hoogeveen, Leonardus P. J.; Peeters, Hendrikus W. C. M.; and Spruijt, Aloysius M. J. M., to Optical Storage International Holland. Optically readable storage disc. 4,622,661, Cl. 369-280.000.
Horak, Daniel; Metalova, Marie; Svec, Frantisek; Drobnik, Jaroslav; Kalal, Jaroslav; Kuzin, Michail I.; Adamian, Arnold A.; Moiseiev, Jurij V.; and Gumargalieva, Klara Z., to Ceskoslovenska akademie ved. X-ray contrast spherical hydrogel particles based on polymer and copolymers of acrylates and methacrylates and the method for preparation thereof. 4,622,367, Cl. 525-381.000.
Horecky, Carl J.: *See—*
Hirschberg, Eugene H.; and Horecky, Carl J., 4,622,210, Cl. 422-144.000.
Horie, Seiji: *See—*
Kondo, Syunichi; Horie, Seiji; Sato, Hideo; and Sano, Kenji, 4,622,278, Cl. 430-59.000.
Makino, Naonori; Kawamura, Kouichi; Horie, Seiji; and Sato, Hideo, 4,622,280, Cl. 430-70.000.
Horiuchi, Masakatsu: *See—*
Izumida, Yukihiro; Majima, Kazuo; Komoro, Hidemasa; Horiuchi, Masakatsu; and Ikeda, Mamoru, 4,622,491, Cl. 313-414.000.
Horiuchi, Susumu: *See—*
Tamata, Shin; and Horiuchi, Susumu, 4,622,175, Cl. 252-628.000.
Horvath, Erzsebet; and Tollas, Gabor, to Phylaxia Oltoanyagtermelo Vallalat. Process for the preparation of a lyophilized vaccine against duck virus hepatitis. 4,622,222, Cl. 424-89.000.
Hosaka, Shuroku: *See—*
Isozaki, Shin; Sasaki, Masaru; and Hosaka, Shuroku, 4,622,601, Cl. 360-48.000.
Hosel, Fritz, to Trutzschler GmbH & Co. KG. Method and apparatus for determining the presence of gaps between textile fiber bales. 4,622,645, Cl. 364-560.000.
Hoshi, Kinji: *See—*
Suzuki, Toshihiko; Isawa, Nobuyuki; Ohkubo, Yasunori; and Hoshi, Kinji, 4,622,211, Cl. 422-248.000.
Hosoe, Yuzuru; Ohta, Norio; Andoo, Keikichi; and Sugita, Yutaka, to Hitachi, Ltd. Garnet film for magnetic bubble memory element. 4,622,264, Cl. 428-332.000.
Hostetler, Dewey L., to DewEze Manufacturing, Inc. Round bale handler. 4,621,776, Cl. 241-101.700.
Hotset Heizpatronen und Zubehor GmbH: *See—*
Schwarzkopf, Eugen, 4,622,455, Cl. 219-541.000.
Hoult, Robert A.; and deMey, Charles F., to Perkin-Elmer Corporation, The. Assembly for positioning an optical element. 4,621,899, Cl. 350-321.000.
House Food Industrial Company Ltd.: *See—*
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, 4,622,446, Cl. 219-10.55R.
Howarth, Stuart I.: *See—*
Page, Robert P.; Cheel, John N.; Howarth, Stuart I.; and Millward, John P., 4,621,722, Cl. 192-0.055.
Howerton, Anderson W.: *See—*
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,622,023, Cl. 474-93.000.
Hoya Corporation: *See—*
Chikano, Mitsuo; and Nakajima, Yuji, 4,621,889, Cl. 350-1.600.
Hoyer, Ernst: *See—*
Meininger, Fritz; Hoyer, Ernst; Otten, Joachim W., deceased; Otten, Ursula, heir; Rudolph nee Otten, Anna G., heir; and Fass, Rudolf, 4,622,390, Cl. 534-634.000.
Hoyland, Trevor B., to Thurne Engineering Company Limited. Bag tying machine. 4,621,479, Cl. 53-133.000.
Hsia, Sung L.; Voigt, Walter; Sawaya, Marty; and Zeoli, Kathryn, to University of Miami. Treatment of skin over androgenicity using compositions containing pregnenolone. 4,622,317, Cl. 514-178.000.
Hsu, Pei-Shun. Mechanism for window blind. 4,621,672, Cl. 160-115.000.
Hubbell, Robert J.: *See—*
Staufenberg, Charles W., Jr.; and Hubbell, Robert J., 4,622,483, Cl. 310-328.000.
Huels Aktiengesellschaft: *See—*
Weiss, Jorn-Volker, 4,622,353, Cl. 523-401.000.
Huey, Larry J.; and Beuther, Paul D., to Owens-Corning Fiberglas Corporation. Method and apparatus for making non-circular mineral fibers. 4,622,054, Cl. 65-2.000.
Hughes, Freddie P.: *See—*
Westlund, Arnold E., Jr.; and Hughes, Freddie P., 4,622,487, Cl. 313-273.000.
Hughes, Robert C.: *See—*
Arnold, Charles, Jr.; Hughes, Robert C.; Kepler, R. Glen; and Kurtz, Steven R., 4,622,355, Cl. 524-89.000.
Hughes Tool Company: *See—*
Babb, Richard C.; and Griffin, Tommy K., 4,621,403, Cl. 29-433.000.
Hull, Michael N.; and Yasnovsky, Vacheslav M., to International Paper Company. Method of oxygen bleaching with ferricyanide lignocellulosic material. 4,622,101, Cl. 162-65.000.
Hull, Michael N.: *See—*
Godsay, Madhu P.; Hull, Michael N.; and Yasnovsky, Vacheslav M., 4,622,100, Cl. 162-65.000.
Humber, Leslie G.: *See—*
Asselin, Andre A.; Crosilla, Danilo A.; and Humber, Leslie G., 4,622,399, Cl. 546-169.000.
Hundley, Raymond E., III, to Gala Industries, Inc. Removable die center for extrusion dies. 4,621,996, Cl. 425-190.000.
Hunter Douglas Inc.: *See—*
Anderson, Richard N., 4,622,255, Cl. 428-116.000.
Huntington Mechanical Laboratories, Inc.: *See—*
Balter, Valentin, 4,621,790, Cl. 251-305.000.
Hurst, Jerry E., Jr.: *See—*
Grobman, Warren D.; Ho, Fahfu; Hurst, Jerry E., Jr.; Ritsko, John J.; and Tomkiewicz, Yaffa, 4,622,095, Cl. 156-635.000.
Hurt, Steven E.: *See—*
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Hussmann Corporation: *See—*
Ares, Roland A.; Cromer, James M.; Schaeffer, Wayne G.; and Wehmeier, William C., 4,621,505, Cl. 62-509.000.
Hutchins, Clyde S.: *See—*
Dicker, Ira B.; Hutchins, Clyde S.; and Spinelli, Harry J., 4,622,372, Cl. 526-190.000.
Hutchison, Marion E., to Tiger Industries, Inc. Segmented auger conveyor. 4,621,968, Cl. 414-311.000.
Huynh-Ba, Tuong; and Osman, Maged A., to Merck Patent Gesellschaft mit beschrankter Haftung. Anisotropic compounds and liquid crystal mixtures. 4,622,163, Cl. 252-299.610.
Hyatt, Robert L.: *See—*
Smith, Francis E.; Hyatt, Robert L.; and Kline, Leonard J., Jr., 4,621,991, Cl. 417-423.00A.
Hydril Company: *See—*
Roche, Joseph R., 4,621,655, Cl. 137-81.200.
I.M.A. - Industria Macchine Automatiche S.p.A.: *See—*
Argazzi, Ivo, 4,621,485, Cl. 53-564.000.
Iacobucci, Paul A., to Stauffer Chemical Company. Inorganic phosphate aerogels and their preparation. 4,622,310, Cl. 502-208.000.
IBM: *See—*
Lewis, Stephan P., 4,622,514, Cl. 324-158.00P.
Ibrahim, Fayez F.; and Fung, Kwok K., to Tyler Refrigeration Corporation. Electronic temperature control for refrigeration system. 4,621,502, Cl. 62-223.000.
Icenogle, Ronald D.; and Djiauw, Lie K., to Shell Oil Company. Low smoke polypropylene insulation compositions. 4,622,350, Cl. 523-200.000.
Icenogle, Ronald D.: *See—*
Djiauw, Lie K.; and Icenogle, Ronald D., 4,622,352, Cl. 523-200.000.
Ichikoh Industries, Limited: *See—*
Endo, Ariyoshi, 4,622,486, Cl. 313-115.000.
Ichimaru, Tuneichi, to Ichimarugiken Co., Ltd. Piston operated valve. 4,621,656, Cl. 137-625.660.
Ichimarugiken Co., Ltd.: *See—*
Ichimaru, Tuneichi, 4,621,656, Cl. 137-625.660.
Ichisaka, Teruo: *See—*
Satoh, Takao; Murakami, Masaki; Kawasaki, Nobuhiro; Ichisaka, Teruo; and Katayama, Shinji, 4,622,113, Cl. 204-98.000.
Idea Network Company, Inc.: *See—*
Swartley, John S., 4,622,231, Cl. 426-438.000.
Identification Products Mfg. Co.: *See—*
Klainos, Michael, 4,621,915, Cl. 354-121.000.
Igarashi, Kouhei: *See—*
Tomita, Kazuo; and Igarashi, Kouhei, 4,622,637, Cl. 364-424.100.
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; and Takeuchi, Yasuhiro, to Nippon Soken, Inc. Method and apparatus for

operating direct injection type internal combustion engine. 4,621,599, Cl. 123-300.000.
IGT: *See—*
Stepan, Donald C.; Waller, Dan J.; and Drews, J. George, 4,621,814, Cl. 273-138.00A.
Iizuka, Nobuyuki: *See—*
Mori, Takanobu; Kashimura, Tetsuo; Fukui, Yutaka; Yanai, Yoshimi; and Iizuka, Nobuyuki, 4,621,499, Cl. 60-752.000.
Iizuka, Yoshio: *See—*
Terada, Atsusuke; Naruto, Shunji; and Iizuka, Yoshio, 4,622,421, Cl. 562-491.000.
Ikeda, Mamoru: *See—*
Izumida, Yukihiro; Majima, Kazuo; Komoro, Hidemasa; Horiuchi, Masakatsu; and Ikeda, Mamoru, 4,622,491, Cl. 313-414.000.
Ikegawa, Toshio: *See—*
Tanouchi, Tatsuji; Ushimoto, Junichi; Okabayashi, Satoru; and Ikegawa, Toshio, 4,622,612, Cl. 361-433.000.
Ikehata, Norimitsu; Kobayashi, Kiyoshi; and Maeda, Hisashi, to Kabushiki Kaisha Toshiba. Composite facsimile apparatus. 4,622,592, Cl. 358-257.000.
Ikenaka, Tokuji; and Omichi, Kaoru, to Wako Pure Chemical Industries, Ltd. Modified oligosaccharides used as substrate for measuring α-amylase activity. 4,622,295, Cl. 435-22.000.
Ikeuchi, Hiroji; and Ikeuchi, Kiyoaki, to Kabushiki Kaisha Ikeuchi Tekkosho. Process and apparatus for producing food product. 4,622,228, Cl. 426-241.000.
Ikeuchi, Kiyoaki: *See—*
Ikeuchi, Hiroji; and Ikeuchi, Kiyoaki, 4,622,228, Cl. 426-241.000.
Ikuta, Shiro; and Homma, Koji, to Nihon Radiator Co., Ltd. Flat tube heat exchanger having corrugated fins with louvers. 4,621,687, Cl. 165-152.000.
Illig, Egon: *See—*
Boley, Dieter; Illig, Egon; and Sturz, Wolfgang, 4,621,854, Cl. 294-88.000.
Imai, Eiichi; Kobayashi, Hiroyuki; and Mitsuhashi, Yasuo, to Canon Kabushiki Kaisha. Magnetic color toner containing gamma ferric oxide particles. 4,622,281, Cl. 430-107.000.
Imai, Isao: *See—*
Miyoshi, Ryota; and Imai, Isao, 4,622,074, Cl. 106-308.00F.
Imai, Tetsuya: *See—*
Koikeda, Minoru; Suzuki, Takashi; Munemura, Koutaro; Nishimoto, Yoshihiko; and Imai, Tetsuya, 4,622,308, Cl. 502-66.000.
Imperial Clevite Inc.: *See—*
Kowal, Leonard J.; Schwarz, Albert J.; and Wells, Norman B., 4,621,842, Cl. 285-322.000.
Implanto-Lock GmbH: *See—*
Koch, Werner L., 4,622,010, Cl. 433-173.000.
In Tech Systems Corp.: *See—*
Slavin, Martin J., 4,622,440, Cl. 381-68.100.
Ina, Hideki: *See—*
Suzuki, Akiyoshi; Ina, Hideki; and Takahashi, Kazuo, 4,621,890, Cl. 350-6.100.
Inaba, Tsutomu: *See—*
Nakamura, Toshiyuki; Sugihara, Masahiro; Inaba, Tsutomu; and Kimura, Tadashi, 4,621,993, Cl. 418-55.000.
Inabe, Tamotsu: *See—*
Wynne, Kenneth J.; Marks, Tobin J.; and Inabe, Tamotsu, 4,622,170, Cl. 252-518.000.
Inco Limited: *See—*
Devuyst, Eric A. P.; and Conard, Bruce R., 4,622,149, Cl. 210-717.000.
Industrial Equipment & Engineering Co.: *See—*
Rahill, Paul F., 4,621,774, Cl. 241-84.200.
Ing. C. Olivetti & C., S.p.A.: *See—*
Musso, Pietro, 4,621,933, Cl. 400-555.000.
Ingersoll-Rand Company: *See—*
Decker, Robert W., 4,621,988, Cl. 417-342.000.
Inland Container Corporation: *See—*
McClure, Jack A., 4,621,766, Cl. 229-52.00B.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,622,449, Cl. 219-69.00R.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Using the weight of the electrode or workpiece to control EDM working conditions. 4,622,449, Cl. 219-69.00R.
Inoue, Minoru, to Fujitsu Limited. Microwave apparatus for vacuum treating and heating a semiconductor substrate. 4,622,447, Cl. 219-10.55R.
Inoue Mtp Kabusiki Kaisha: *See—*
Takeuchi, Shin, 4,622,191, Cl. 264-134.000.
Inoue, Toshitugu: *See—*
Maruo, Tomohiro; Okutani, Norio; and Inoue, Toshitugu, 4,622,502, Cl. 318-640.000.
Inouye, Shigeharu: *See—*
Takematsu, Tetsuo; Konnai, Makoto; Tachibana, Kunitaka; Tsuruoka, Takashi; Inouye, Shigeharu; and Watanabe, Tetsuro, 4,622,060, Cl. 71-86.000.
InPro Technologies, Inc.: *See—*
Krueger, Roger J., 4,621,974, Cl. 414-786.000.
Insituform Holdings Limited: *See—*
Wood, Eric, 4,622,196, Cl. 264-229.000.
Instruments S.A.: *See—*
Laude, Jean-Pierre; Flamand, Jean; Pitois, Gerard; and Lepere, Didier, 4,622,662, Cl. 370-3.000.
Interaction Systems, Inc.: *See—*
Bloom, Jonathan J.; Marino, Michael J.; and Pepper, Edward L., Jr., 4,622,437, Cl. 178-18.000.
Interactive Research Corporation: *See—*
Cerchio, Gerard J., 4,622,013, Cl. 434-118.000.
International Biotechnologies, Inc.: *See—*
Kreisher, John H.; and McCarthy, Thomas L., 4,622,124, Cl. 204-301.000.
International Business Machines Corporation: *See—*
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Martin, Philip T., 4,622,441, Cl. 379-345.000.
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Foster, John A., 4,621,744, Cl. 220-270.000.
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Jackson, Frank W., 4,621,729, Cl. 206-37.000.
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Jacobson, Chester F., to Gillette Company, The. Razor blade assembly. 4,621,424, Cl. 30-41.000.
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Jagers, Leopold. Motor-vehicle trailer for transporting removable superstructures. 4,621,857, Cl. 296-35.300.
James, Edmund H., III: *See*—
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James Howden & Company Ltd.: *See*—
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Janecek, Louis; and Wykoff, Richard H., to AMSTED Industries Incorporated. Pressure filter apparatus. 4,622,144, Cl. 210-351.000.
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Jeschke, Willi, to Heidelberger Druckmaschinen AG. Printing unit of an offset rotary printing machine. 4,621,575, Cl. 101-217.000.
Jet Research Center, Inc.: *See*—
Walker, Jerry L.; Crummett, Donald L.; and Behling, William C., 4,621,396, Cl. 29-1.300.
Jodoin, Raymond C.: *See*—
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Johansson, Sven H.; and Nytomt, Jan G., to Saab-Scania Aktiebolag. Connection device in an ignition system. 4,621,881, Cl. 339-26.000.
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Johnson, Donald L., Jr.: *See*—
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Johnson, J. Wallace; and LoMaglio, Lewis C., to Liquid Level Lectronics, Inc. Electric pump. 4,621,566, Cl. 92-13.400.
Johnson, John A.; Gandolf, Edward O.; and Hardy, Stephen N., to American Greetings Corporation. Knock-down merchandise display fixture. 4,621,878, Cl. 312-257.00R.
Johnson & Johnson Products, Inc.: *See*—
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Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
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Tamura, Hisaaki, 4,622,466, Cl. 250-374.000.
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K.K. Osako Seisakusho: *See*—
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Kaesling, Heinz; Dinkel, Emil; and Mann, Bernd, to Brose Fahrzeugteile GmbH & Co. KG. Installation for the longitudinal adjustment of a seat. 4,621,784, Cl. 248-430.000.

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Kain, Arthur F. Suspension idler method and apparatus. 4,621,728, Cl. 198-827.000.

Kaiser, Horst; Heinzmann, Ulrich; and Sturm, Alfred, to Swiss Aluminium Ltd. Means of anchorage of anode pins or stubs in a carbon anode. 4,621,674, Cl. 164-103.000.

Kaku, Toshimitsu; Nakao, Takeshi; and Tsunoda, Yoshito, to Hitachi, Ltd. Optical information recording apparatus. 4,622,564, Cl. 346-160.000.

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Horak, Daniel; Metalova, Marie; Svec, Frantisek; Drobnik, Jaroslav; Kalal, Jaroslav; Kuzin, Michail I.; Adamian, Arnold A.; Moiseiev, Jurij V.; and Gumargalieva, Klara Z., 4,622,367, Cl. 525-381.000.

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Kamijo, Yoshimi: *See*—
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Kamiya, Kohji: *See*—
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Kamiya, Masaaki; and Kojima, Yoshikazu, to Seiko Instruments & Electronics Ltd. Non-volatile semiconductor memory. 4,622,656, Cl. 365-185.000.

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Kanai, Seita, to Mazda Motor Corporation. Automotive suspension system. 4,621,830, Cl. 280-675.000.

Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, to Mazda Motor Corp.; and Nippon Seiko K.K. Four-wheel steering apparatus of a vehicle. 4,621,702, Cl. 180-140.000.

Kanbe, Sadao: *See*—
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Kandatsu, Kiyoshi; Uchida, Naoshi; and Asahi, Nobuo, to Fuji Electric Co., Ltd. Circuit breaker housing and attachment box. 4,622,444, Cl. 200-303.000.

Kandetzke, Steven M.: *See*—
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Kane, John P.; Cser, Daniel; and Dall, Robert H., to Allied Automation Systems, Inc.; and General Motors Corp. Tire mounting system. 4,621,671, Cl. 157-1.100.

Kaneda, Naoya, to Canon Kabushiki Kaisha. Automatic focusing adjustment device. 4,621,917, Cl. 354-403.000.

Kaneko, Ichiro: *See*—
Shimizu, Toshihide; Kaneko, Ichiro; and Shimakura, Yoshiteru, 4,622,245, Cl. 427-230.000.

Kanfer, Joseph S., to Go-Jo Industries. Dispensing apparatus. 4,621,749, Cl. 222-153.000.

Kano, Mitsuru; Kato, Yoshinori; Kamijo, Yoshimi; and Hatano, Masahiro, to Alps Electric Co., Ltd; and Hatano, Masahiro. Liquid crystal mixture of a liquid crystal compound having a smectic C phase and an optically active compound. 4,622,165, Cl. 252-299.650.

Kant, Bernhard; and Lauth, Hans-Georg, to VDO Adolf Schindling AG. Container having a device for the electric measurement of the level of a liquid contained within it. 4,621,526, Cl. 73-304.00R.

Kaplan, David S.: *See*—
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Kappner, Manfred; and Metz, Harald, to Merck Patent Gesellschaft mit beschrankter Haftung. Process and agent for testing the sensitivity of bacteria. 4,622,297, Cl. 435-32.000.

Karcey, Jon, to Watson Karcey International. Reusable liquid filter assembly. 4,622,136, Cl. 210-168.000.

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Kelly Ryan Equipment Co.: *See*—
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Kenna, Robert V., to Pfizer Hospital Products Group, Inc. Guide for femoral neck osteotomy. 4,621,630, Cl. 128-92.0VD.
Kenyon, Ralph E.: *See*—
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Keys, Steven F., to Essex Group, Inc. Method and apparatus for accurately dispensing a solution. 4,622,241, Cl. 427-117.000.
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Kikuchi, Morio: *See*—
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Christiansen, Richard L.; and Kim, Hiemi, 4,621,522, Cl. 73-61.00R.
Kim, Oh-Kil, to United States of America, Navy. Moldable electrically conductive polymer compositions. 4,622,266, Cl. 428-394.000.
Kimball International, Inc.: *See*—
Slaats, Mathew A.; and Strange, Patrick E., 4,621,868, Cl. 297-347.000.
Kimberly-Clark Corporation: *See*—
Orchard, Lewis P.; and Simon, Judi K., 4,621,808, Cl. 272-119.000.
Sheldon, Donald A.; and Tews, Richard R., 4,622,030, Cl. 604-15.000.
Kimura, Eiji: *See*—
Hatanaka, Norio; Hata, Tsutae; Oketani, Yoshio; and Kimura, Eiji, 4,621,517, Cl. 72-441.000.
Kimura, Naofumi; Makagawa, Kenichi; Ishii, Yutaka; and Funada, Fumiaki, to Sharp Kabushiki Kaisha. Liquid crystal composition. 4,622,162, Cl. 252-299.500.
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Kin, Frederick R.: *See*—
McManus, Derek; and Kin, Frederick R., 4,622,212, Cl. 423-226.000.
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Bohannon, William D., Jr.; Brent, Herbert E.; Hamilton, Alfred S.; and Kinard, Michael D., 4,622,092, Cl. 156-461.000.
Kinetic Concepts, Inc.: *See*—
Shattuck, Bruce T., 4,622,034, Cl. 604-179.000.
King, Francis G.; and Gable, Stewart V., to Ford Motor Company. Accelerator pedal actuator system for automatic driving system. 4,621,525, Cl. 73-117.000.
King, Wendell B.; Rhoads, Ronald I.; and Tarbox, Robert H., to Dana Corporation. Method of producing a friction welded article. 4,621,760, Cl. 228-112.000.
Kinnan, Frank, to Electric Power Research Institute. Techniques for establishing inground support footings and for strengthening and stabilizing the soil at inground locations. 4,621,950, Cl. 405-231.000.
Kinnan, Frank R., to L & F Company. Plug assembly and method for encapsulating a cable within a conduit. 4,622,436, Cl. 174-77.00R.
Kinney, Richard G.: *See*—
McGill, Leland S., 4,621,380, Cl. 4-476.000.
Kinoshita, Mitsuo; and Obara, Haruki, to Fanuc Ltd. Method of measuring flexure value of wire electrode. 4,622,450, Cl. 219-69.00W.
Kinst, Dennis I. Wall panel system. 4,621,477, Cl. 52-780.000.
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Wiersema, Dale T.; and Kirschensteiner, Fred, 4,621,850, Cl. 294-81.610.
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Kiso, Masamitsu: *See*—
Matsuura, Sadaji; Ando, Satoru; and Kiso, Masamitsu, 4,622,071, Cl. 106-97.000.
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Kitchen, John A. Heater and burner assembly therefor. 4,621,609, Cl. 126-56.000.
Kitchen, Richard L.; and Blakesley, Richard C., to Gleason Works, The. Gear cutter assembly. 4,621,954, Cl. 407-22.000.
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Dohmann, Fritz; Franz, Peter; Klaas, Friedrich; and Schulze, Gunter, 4,621,514, Cl. 72-354.000.
Klainos, Michael, to Identification Products Mfg. Co. Multi-image camera. 4,621,915, Cl. 354-121.000.
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Kleiman, William J., to Rockwell International Corporation. Automaton tool mounting system. 4,621,398, Cl. 29-26.00A.
Klein, Gary G. Light weight bicycle with improved chainstay structure and method. 4,621,827, Cl. 280-281.00R.
Klein, Jurgen: *See*—
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Senft, Ernst; Hirth, Hans; and Klemmer, Herbert, 4,621,538, Cl. 74-512.000.
Klessing, Klaus; and Chatterjee, Shyam S., to Dr. Willmar Schwabe GmbH & Co. 1.4;3.6-Dianhydrohexitol nitrates substituted by purine bases, and pharmaceutical compositions. 4,622,324, Cl. 514-265.000.
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Pals, Jan A.; and Klinkhamer, Arend J., 4,622,567, Cl. 357-23.100.
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Klocke, Harald, to H. Kuhne GmbH KG. Bistable magnetic valve. 4,621,660, Cl. 137-625.440.
Kloke, Werner, to H. H. Robertson Company. Glazed structural system and components therefor. 4,621,472, Cl. 52-397.000.
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Klyne, Albert A., to Diversified Drilling Services Ltd. Sucker rod coupling. 4,621,690, Cl. 166-241.000.
Knab, Rudiger, to Ford Motor Company. Heat exchanger with valved pipe connection. 4,621,683, Cl. 165-86.000.
Kneidel, Kurt E.; and Luu, Minh, to Babcock & Wilcox Company, The. Insert for insulated steam injection tubing. 4,621,838, Cl. 285-41.000.
Knifton, John F.; and Grice, Neal J., to Texaco Inc. Process for C_1–C_4 alkanol production from synthesis gas using a trimetallic catalyst. 4,622,343, Cl. 518-700.000.

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Knoell, Helmut: *See—*
Pennewiss, Horst; Schweder, Roland; and Knoell, Helmut, 4,622,358, Cl. 524-297.000.

Knorr, Andreas: *See—*
Wehinger, Egbert; Meyer, Horst; and Knorr, Andreas, 4,622,332, Cl. 514-356.000.

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Tsuchida, Seiichi; Kodama, Yoshihiro; and Hara, Hiroari, 4,622,357, Cl. 524-270.000.

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Salani, C. Ranjan, 4,621,871, Cl. 299-91.000.

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Lattek, Horst; Fink, Hans-Ferdi; and Koerner, Gotz, 4,621,521, Cl. 73-60.100.

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Suzuki, Shigeo; and Fujita, Tatsuo, 4,621,677, Cl. 165-135.000.

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Glass, Alastair M.; Kohl, Paul A.; Lum, Richard M.; and Ostermayer, Frederick W., Jr., 4,622,114, Cl. 204-129.300.

Kohler, Josef, to Continental Gummi-Werke Aktiengesellschaft. Press for continuously producing band-like articles. 4,621,998, Cl. 425-329.000.

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Borowski, Horst; Moller, Knut; Wiethaup, Wolfgang; Rodemeyer, Gunther; Henning, Paul-Georg; and Kohn, Erhard, 4,621,651, Cl. 131-361.000.

Koike, Eishi, to Ozen Corporation. Simplified sound reproducing device having switchable circuits. 4,622,658, Cl. 369-31.000.

Koike, Takahisa, to Ricoh Company, Ltd. Image forming method for dot matrix printer. 4,622,561, Cl. 346-1.100.

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Konno, Iseo: *See—*
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Bickes, Robert W., Jr.; Kopczewski, Michael R.; and Schwarz, Alfred C., 4,621,577, Cl. 102-200.000.

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Yoon, Han Sik; Son, Tae Won; Lee, Chul Joo; and Min, Byung Ghyl, 4,622,265, Cl. 428-364.000.

Kornrumpf, William P.: *See—*
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Koskivsara, Timo T.: *See—*
Berghall, Christer K.; Ollikainen, Jukka S.; and Koskivaara, Timo T., 4,621,969, Cl. 414-331.000.

Kostich, Jeffrey V., to Smithers Medical Products, Inc. Method and apparatus for molding and accurately repositioning selected portions of the human anatomy. 4,622,185, Cl. 264-45.200.

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Ceccon, Claude R.; and Kovara, Joseph N., 4,622,633, Cl. 364-200.000.

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Kozlowski, Robert M.: *See—*
Jennings, William B.; Kozlowski, Robert M.; and Hayes, Richmond S., Jr., 4,621,682, Cl. 165-76.000.

Kozuka, Hajime, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Power steering system. 4,621,704, Cl. 180-143.000.

Kramer, Thomas, to Coca-Cola Company, The. Closing means for trucks. 4,621,862, Cl. 296-183.000.

Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Reinecke, Paul; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidal hydroxyethylazolyl-oxime derivatives. 4,622,335, Cl. 514-383.000.

Kramer, Wolfgang: *See—*
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Kraus, Albert J.: *See—*
Jackson, W. Ronald; Kraus, Albert J.; and Lerdon, Wesley E., 4,621,863, Cl. 297-85.000.

Krause, Robert F.; and Gosik, Curtis J., to Westinghouse Electric Corp. Amorphous metal transformer with low loss core. 4,621,416, Cl. 29-606.000.

Kreisher, John H.; and McCarthy, Thomas L., to International Biotechnologies, Inc. Device for horizontal electroblotting. 4,622,124, Cl. 204-301.000.

Kresge, Edward N.; and Hazelton, Donald R., to Exxon Research & Engineering Co. Method for making free flowing coated rubber pellets. 4,622,193, Cl. 264-141.000.

Kress, Hans-Jurgen: *See—*
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Krob, Erwin; and Bauer, Helmut, to TMC Corporation. Safety ski binding. 4,621,829, Cl. 280-628.000.

Krogh, James A., to PPG Industries, Inc. Method for preparing amino acid ester hydrohalides. 4,622,413, Cl. 560-38.000.

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Kroll, Holgar. Carrying handle. 4,621,855, Cl. 294-171.000.

Kronisch, Alan D.: *See—*
Squires, John P.; Kronisch, Alan D.; Freeman, John J.; and Touchton, James J., 4,622,499, Cl. 318-254.000.

Krueger, Roger J., to InPro Technologies, Inc. Automated pipe equipment system. 4,621,974, Cl. 414-786.000.

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Krumme, John F., to Beta Phase, Inc. Thermally responsive electrical connector. 4,621,882, Cl. 339-30.000.

Kruschwitz, Werner, to Draflex Industries Limited. Window glass fixture arrangements. 4,621,469, Cl. 52-208.000.

Kubis, Heribert, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Single-circuit cooling system for intercooled marine engines. 4,621,594, Cl. 123-41.090.

Kubo, Haruaki; and Kawashita, Hidemori, to Daishowa Seiki Co., Ltd. Machine tool holder unit. 4,621,548, Cl. 82-1.200.

Kubo, Keishi: *See—*
Watanabe, Hideo; Kawasaki, Kanjiro; Kubo, Keishi; Hakiri, Minoru; and Takigawa, Nobuhiro, 4,622,565, Cl. 346-201.000.

Kubo, Seitoku: *See*—
Tsukamoto, Kazumasa; Taniguchi, Takuji; Kubo, Seitoku; and Taga, Yutaka, 4,621,710, Cl. 184-6.270.
Kubota, Ltd.: *See*—
Yotsumoto, Toshiyuki; and Umemoto, Tomeo, 4,621,872, Cl. 301-124.00H.
Kufner, Walter; and Winter, Heinrich, to SKF GmbH, Schweinfurt. Four-row cylindrical roller bearing for the working or back-up rolls of high-speed rolling stands. 4,621,932, Cl. 384-569.000.
Kugel, Raimund: *See*—
Wurfel, Reinhart; Zangenfeind, Helmut; Domges, Gunther; and Kugel, Raimund, 4,621,970, Cl. 414-412.000.
Kuhn S.A.: *See*—
Urlacher, Jean-Pierre; and Lang, Denis, 4,621,487, Cl. 56-228.000.
Kuhr, Albert F.; and Wendt, Alan C., to United States Gypsum Company. Base trim system for partition corners. 4,621,471, Cl. 52-288.000.
Kulisch, Ulrich. Circuitry for generating scalar products and sums of floating point numbers with maximum accuracy. 4,622,650, Cl. 364-748.000.
Kumahira Safe Co. Inc.: *See*—
Naruto, Eiro; and Masachika, Hiroshi, 4,622,456, Cl. 235-379.000.
Kumakura, Kazumasa, to Ricoh Company, Ltd. ARQ transmission system. 4,622,682, Cl. 375-58.000.
Kuna, Wayne A.: *See*—
Katzman, Allison W.; Rosenwinkel, Donald A.; and Kuna, Wayne A., 4,622,019, Cl. 446-153.000.
Kung, Viola T.; and Canova-Davis, Eleanor. Liposome immunoassay reagent and method. 4,622,294, Cl. 435-7.000.
Kunugi, Yoshiro: *See*—
Tokumo, Akio; Kunugi, Yoshiro; Yoshimi, Toshikazu; Kato, Shinjiro; Sasaki, Yoshio; Odaka, Makoto; and Sato, Takeshi, 4,622,691, Cl. 381-86.000.
Kupersmith, Bertram F.; Shull, Julian H.; Full, Gary G.; and Schienda, Gregory A., to Otis Elevator Company. Half-duplex industrial communications system. 4,622,551, Cl. 340-825.060.
Kupzik, Roland, to Robert Bosch GmbH. Fuel injection pump in internal combustion engines. 4,621,601, Cl. 123-374.000.
Kurahashi, Yoshio: *See*—
Saito, Junichi; Kurahashi, Yoshio; Goto, Toshio; and Yamaguchi, Naoko, 4,622,064, Cl. 71-92.000.
Kurimoto, Masahiro, to Sokkisha Co., Ltd. Position detecting apparatus. 4,621,436, Cl. 33-561.000.
Kurimoto, Yoshitane. Article moving system with drive arms and guide channels. 4,621,581, Cl. 104-140.000.
Kuroda, Kazuo, to Pioneer Electronic Corporation. FM demodulator with impulse noise elimination circuit. 4,622,520, Cl. 329-112.000.
Kuroda, Shigeru: *See*—
Takadera, Ichiro; and Kuroda, Shigeru, 4,621,831, Cl. 280-689.000.
Kuroda, Sinji, to Rinnai Corporation. Ignition and flame monitoring device. 4,622,005, Cl. 431-78.000.
Kuroiwa, Katsumasa: *See*—
Nagasawa, Takeshi; Nakamura, Yoshio; Enomoto, Tsuyoshi; and Kuroiwa, Katsumasa, 4,622,389, Cl. 530-331.000.
Kurt Manufacturing Company, Inc.: *See*—
Lenz, John O., 4,621,430, Cl. 33-125.00M.
Kurtz, Steven R.: *See*—
Arnold, Charles, Jr.; Hughes, Robert C.; Kepler, R. Glen; and Kurtz, Steven R., 4,622,355, Cl. 524-89.000.
Kutaragi, Ken, to Sony Corporation. System for recording and/or reproducing digital data. 4,622,602, Cl. 360-48.000.
Kuzin, Michail I.: *See*—
Horak, Daniel; Metalova, Marie; Svec, Frantisek; Drobnik, Jaroslav; Kalal, Jaroslav; Kuzin, Michail I.; Adamian, Arnold A.; Moiseiev, Jurij V.; and Gumargalieva, Klara Z., 4,622,367, Cl. 525-381.000.
Kyocera Corporation: *See*—
Mizutani, Michitaka, 4,622,186, Cl. 264-62.000.
Kyoei Co., Ltd.: *See*—
Toshitsugu, Kitayama, 4,622,229, Cl. 426-395.000.
L & F Company: *See*—
Kinnan, Frank R., 4,622,436, Cl. 174-77.00R.
Lade, Robert W.; Benjamin, James A.; and Schutten, Herman P., to Eaton Corporation. Lateral bidirectional power FET with notched multi-channel stacking and with dual gate reference terminal means. 4,622,569, Cl. 357-23.400.
Lade, Robert W.: *See*—
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,622,568, Cl. 357-23.400.
Laederach, H. E.: *See*—
Hiltebrand, Peter; Ruf, Arthur; Laederach, H. E.; and Gschwend, K., 4,622,151, Cl. 210-739.000.
Lagadec, Roger: *See*—
Doi, Toshitada; Brandes, Claudia; and Lagadec, Roger, 4,622,598, Cl. 360-22.000.
Lagakos, Nicholas; Cole, James H.; and Bucaro, Joseph A., to United States of America, Navy. Optical fibers with reduced pressure sensitivity to high frequency acoustic field. 4,621,896, Cl. 350-96.290.
Laguzza, Bennett C., to Eli Lilly and Company. Dialkylaminotetrahydroquinazoline. 4,622,398, Cl. 544-292.000.
Lah, Gunnar: *See*—
Babendererde, Siegmund; and Lah, Gunnar, 4,621,947, Cl. 405-146.000.
Lamarle: *See*—
Yuen, Tony, 4,621,670, Cl. 150-55.000.
Lamb, C. Paul, to Teledyne Industries, Inc. Actuator control system. 4,621,496, Cl. 60-479.000.
Lanciaux, Francis, to Thompson, Donald M., a part interest. Energy efficient clothes dryer. 4,621,438, Cl. 34-77.000.
Landau, Richard F., to Oerlikon Buhrle U.S.A. Inc. Planar magnetron cathode target assembly. 4,622,122, Cl. 204-298.000.
Lang, Denis: *See*—
Urlacher, Jean-Pierre; and Lang, Denis, 4,621,487, Cl. 56-228.000.
Lang, Franz J., to Display-Design GmbH fur moderne Verkaufsforderungsmittel und Raumausstattung. Multi-story tower for goods display. 4,621,740, Cl. 211-133.000.
Lange, Fritz. Apparatus for cleaning fruits and vegetables. 4,621,573, Cl. 99-626.000.
Langenfeld, Joseph W.; and Westendorf, Neal W., to Westendorf Mfg. Co., Inc. Tractor loader having multi-adjustment mountings. 4,621,973, Cl. 414-686.000.
Lanni, Frederick; Taylor, D. Lansing; and Waggoner, Alan S., to Carnegie-Mellon University. Standing wave luminescence microscopy. 4,621,911, Cl. 350-524.000.
Lantzsch, Reinhard; Ditgens, Klaus; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidal hydroxyalkynyl-azolyl derivatives. 4,622,333, Cl. 514-383.000.
Lapka, Galen G.; Mason, Norbert S.; and Thies, Curt, to Washington University, The. Process for preparation of microcapsules. 4,622,244, Cl. 427-213.320.
Laporte Industries Limited: *See*—
Comyns, Alan E.; Morris, Gareth W.; and Sankey, John P., 4,622,214, Cl. 423-277.000.
Larson, James H., to Graco Inc. Centrifugal pump seal. 4,621,975, Cl. 415-111.000.
Larsson, Lars-Erik A.: *See*—
Jonsson, Stig R. E.; and Larsson, Lars-Erik A., 4,622,665, Cl. 370-100.000.
Lasercon Corporation: *See*—
Merry, J. Bradford; and Brown, Lawrence B., 4,621,926, Cl. 356-363.000.
Lattek, Horst; Fink, Hans-Ferdi; and Koerner, Gotz, to Th. Goldschmidt AG. Apparatus for determining foam formation of crude petroleum. 4,621,521, Cl. 73-60.100.
Laude, Jean-Pierre; Flamand, Jean; Pitois, Gerard; and Lepere, Didier, to Instruments S.A. Wavelength-selective multiplexer-demultiplexer. 4,622,662, Cl. 370-3.000.
Lauritzen, Nels J., to Johnson & Johnson Products, Inc. Method of making blister pad adhesive bandage. 4,622,089, Cl. 156-250.000.
Lauth, Hans-Georg: *See*—
Kant, Bernhard; and Lauth, Hans-Georg, 4,621,526, Cl. 73-304.00R.
Law, Thomas. Trailer hook-up guide system. 4,621,432, Cl. 33-264.000.
Lawson, Lawrence J., to Dominion Tool & Die Company. Apparatus and method for prestretching and tensioning flexible drive members. 4,622,024, Cl. 474-102.000.
Lazar, Janos: *See*—
Bernath, Gabor; Kobor, Jeno ; Lazar, Janos; Motika, Gabor; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , 4,622,329, Cl. 514-307.000.
Leach, Robert M.; and Ziobro, Richard J., to Osmose Wood Preserving Co. of America, Inc. Preservative composition for wood. 4,622,248, Cl. 427-440.000.
LeaRonal, Inc.: *See*—
Martin, James L.; McCaskie, John E.; and Toben, Michael P., 4,622,110, Cl. 204-47.000.
Leary-Renick, Pamela A.; and Srinivasan, Rangaswamy, to International Business Machines Corporation. Formation of a multi-layer glass-metallized structure formed on and interconnected to multi-layered-metallized ceramic substrate. 4,622,058, Cl. 65-105.000.
Leco Corporation: *See*—
Bredeweg, Roger L., 4,622,009, Cl. 432-156.000.
Lee, Chul Joo: *See*—
Yoon, Han Sik; Son, Tae Won; Lee, Chul Joo; and Min, Byung Ghyl, 4,622,265, Cl. 428-364.000.
Lee, George F.: *See*—
McAmish, Larry H.; Addy, Tralance O.; and Lee, George F., 4,622,259, Cl. 428-171.000.
Lee, James F. Portable barbecue system. 4,621,608, Cl. 126-9.00R.
Lee, Kyu H.; and Porter, Christopher H., to Extracorporeal Medical Specialties, Inc. Device useful in the treatment of blood. 4,622,140, Cl. 210-177.000.
Lee, Robert E. Oscillating skateboard. 4,621,825, Cl. 280-218.000.
Leek, John G. Side stroking golf putter. 4,621,816, Cl. 273-168.000.
Leen, Robert G.: *See*—
Pipkorn, David N.; and Leen, Robert G., 4,622,562, Cl. 346-75.000.
Leenders, Petrus J. M.: *See*—
Withoos, Wilhelmus H. C.; Leenders, Petrus J. M.; Benning, Franciscus H. C.; and van de Meij, Johannes, 4,622,560, Cl. 346-1.100.
Leeseberg, Bruce H.: *See*—
Reichle, Gregory C.; and Leeseberg, Bruce H., 4,621,746, Cl. 221-76.000.
Lefor, Don. Lock for sliding doors. 4,621,846, Cl. 292-152.000.
Legeler, Hans-Jurgen: *See*—
Simon, Bernd; Dammann, Hanns-Gerd; Muller, Peter; Legeler, Hans-Jurgen; Orth, Dieter; and Radunz, Hans-Eckart, 4,622,316, Cl. 514-162.000.
Leigh-Monstevens, Keith V., to Automotive Products plc. Hydraulic slave cylinder switch. 4,621,565, Cl. 92-5.00R.
Lenz, John O., to Kurt Manufacturing Company, Inc. Drive for position controlled linearly movable carriage. 4,621,430, Cl. 33-125.00M.

Leonard, George H., to Airpot Corporation. Torsion spring mounting structure for ensuring proper torsion spring orientation. 4,621,391, Cl. 16-299.000.

Lepere, Didier: *See—*
Laude, Jean-Pierre; Flamand, Jean; Pitois, Gerard; and Lepere, Didier, 4,622,662, Cl. 370-3.000.

Leppert, Norbert: *See—*
Streit, Werner; Bassing, Dieter; Gebert, Karlheinz; Klippel, Friedrich; and Leppert, Norbert, 4,622,037, Cl. 8-108.100.

Lerdon, Wesley E.: *See—*
Jackson, W. Ronald; Kraus, Albert J.; and Lerdon, Wesley E., 4,621,863, Cl. 297-85.000.

Le Roy, Pierre: *See—*
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,622,393, Cl. 540-215.000.

Les Fils d'Auguste Scheuchzer S.A.: *See—*
Scheuchzer, Fredy; and Buehler, Fritz, 4,621,460, Cl. 51-178.000.

Lester, Theodore V., to Motorola, Inc. Dynamic focus system cascode amplifier. 4,622,498, Cl. 315-382.000.

Letterman, Leslie E., to Boeing Company, The. Resin film infusion process and apparatus. 4,622,091, Cl. 156-286.000.

Leung, Chi H.; and DeNuccio, Ron J., to GTE Products Corporation. Electrical contact and process for making the same. 4,622,269, Cl. 428-550.000.

Levefelt, Bert G., to Santrade Limited. Support for a cutting tool for cutting hard material. 4,621,870, Cl. 299-91.000.

Lever Brothers Company: *See—*
Butterworth, Robert M.; Martin, John R.; and Willis, Edwin, 4,622,154, Cl. 252-8.800.

Levine, Jeffrey A.: *See—*
Anderson, Robert K.; Foster, Ruth E.; and Levine, Jeffrey A., 4,621,591, Cl. 119-130.000.

Levine, Peter A., to RCA Corporation. Solid-state imager chip mounting. 4,622,580, Cl. 358-50.000.

Levolor Lorentzen, Inc.: *See—*
Georgopoulos, George; Toledo, Manuel; and Teran, Jorge, 4,621,673, Cl. 160-168.00R.

Levy, Harry. Thermal laminated lining and method of manufacture. 4,622,253, Cl. 428-91.000.

Lewis, David A.: *See—*
Marshall, Larry A.; and Lewis, David A., 4,621,976, Cl. 415-191.000.

Lewis, Stephan P., to IBM. Multiple mode buckling beam probe assembly. 4,622,514, Cl. 324-158.00P.

Leybold-Heraeus GmbH: *See—*
Spruck, Helmut, 4,622,453, Cl. 219-121.0ET.

Lhoste, Jean-Francois; and Delage, Thierry, to Reckitt & Colman S.A. Device for diffusing volatile liquids. 4,621,768, Cl. 239-44.000.

Li, Yuan-Lu: *See—*
Kasbia, Puran S.; and Li, Yuan-Lu, 4,622,439, Cl. 379-252.000.

Licci, Francesca; Rinaldi, Stefano; and Besagni, Tullo, to Consiglio Nazionale Delle Ricerche. Method for the preparation of fine hexagonal ferrite powders, in particular, for magnetic recording. 4,622,159, Cl. 252-62.630.

Lieb, Folker; Oediger, Hermann; Kabbe, Hans-Joachim; Niewohner, Ulrich; Perzborn, Elisabeth; and Seuter, Friedel, to Bayer Aktiengesellschaft. Novel norbornane- and norbornene-carboxylic acid amides thromboxan antagonists. 4,622,339, Cl. 514-563.000.

Lier, Hans-Peter: *See—*
Weber, Herbert; and Lier, Hans-Peter, 4,622,694, Cl. 455-47.000.

Lifeline Systems, Inc.: *See—*
Bially, Theodore; and Ditz, Marc W., 4,622,544, Cl. 340-636.000.

Lignes Telegraphiques et Telephoniques L.T.T.: *See—*
Gouali, Mohamed, 4,621,894, Cl. 350-96.190.

Likozar, Martin E., to Donn Incorporated. Concrete metal-backed access floor panel. 4,621,468, Cl. 52-126.600.

Lindberg, Thomas J.: *See—*
Baran, John S.; Lindberg, Thomas J.; and Lowrie, Harman S., 4,622,338, Cl. 514-460.000.

Linear Technology Corporation: *See—*
Redfern, Thomas P., 4,622,521, Cl. 330-9.000.

Linear Technology Inc.: *See—*
Cole, William A., 4,622,692, Cl. 381-94.000.

Ling, Chung-Mei, to General Biologicals Corp. Method for washing an immunoassay tray and its apparatus. 4,622,076, Cl. 134-32.000.

Lipson, Eric B.: *See—*
Golden, Frederick L., 4,621,467, Cl. 52-81.000.

Liquid Level Lectronics, Inc.: *See—*
Johnson, J. Wallace; and LoMaglio, Lewis C., 4,621,566, Cl. 92-13.400.

Littleford Bros., Inc.: *See—*
Resing, Thomas A.; and Ely, George L., 4,622,152, Cl. 210-769.000.

Littlewood, Paul A.: *See—*
Graves, Alan F.; Littlewood, Paul A.; and Weiss, Johannes S., 4,622,666, Cl. 370-100.000.

Litton Systems, Inc.: *See—*
Tran, Kim N. T., 4,621,415, Cl. 29-589.000.

Liu, Ping Y., to General Electric Company. Polycarbonate film composition exhibiting a low kinetic coefficient of friction and comprising glass particles and fatty acid. 4,622,359, Cl. 524-322.000.

Liu, Qing-Guo; and Worrell, Wayne L., to University Patents, Inc. Method for measuring gaseous sulfur dioxide. 4,622,105, Cl. 204-1.00T.

Lloyd, James R., Jr.: *See—*
Fouts, David P.; Gupta, Devandra; Ho, Paul S.; Jaspal, Jasvir S.; Lloyd, James R., Jr.; Oberschmidt, James M.; Srikrishnan, Kris V.; and Sullivan, Michael J., 4,622,205, Cl. 420-566.000.

Lo, Young S.: *See—*
Sheehan, John C.; and Lo, Young S., 4,622,394, Cl. 540-228.000.

Lobach, Ernst: *See—*
Tabarelli, Werner; and Lobach, Ernst, 4,621,922, Cl. 355-41.000.

Lobban, Peter E.: *See—*
Stefanski, Andrew; Sturtevant, Alfred H.; Konicek, Michael G.; and Lobban, Peter E., 4,622,468, Cl. 250-458.100.

Lockheed Missiles & Space Company, Inc.: *See—*
Williams, Samuel G. L., 4,621,924, Cl. 356-153.000.

Loctite Corporation: *See—*
Jacobine, Anthony F.; and Glaser, David M., 4,622,348, Cl. 522-27.000.

Loctite Limited: *See—*
McKervey, M. Anthony, 4,622,414, Cl. 560-61.000.

Loeb, Phillip J.: *See—*
Buss, Leonard A.; Loeb, Phillip J.; and Prysby, Daniel G., 4,622,539, Cl. 340-506.000.

Login, Robert B.; and Anchor, Michael J., to BASF Corporation. Low residue fiber spin finishes. 4,622,038, Cl. 8-115.600.

Lohmann, Gerd, to United States of America, Army. Satellite optical scan device. 4,621,893, Cl. 350-6.500.

LoMaglio, Lewis C.: *See—*
Johnson, J. Wallace; and LoMaglio, Lewis C., 4,621,566, Cl. 92-13.400.

Long, Delmar D., to Dayco Corporation. Method and apparatus for producing elastomer-coated bias fabric. 4,622,243, Cl. 427-176.000.

Long, Eric L.; and Brey, Anton, to Switchcraft, Inc. Tool and method for cleaving optical fibers. 4,621,754, Cl. 225-96.000.

Lopez, Gilbert T., to Cencorp. Method and apparatus for separating printed-circuit boards from multi-board panels. 4,621,552, Cl. 83-27.000.

Lorenz, Manfred; and Schundehutte, Karl H., to Bayer Aktiengesellschaft. Inclusion compounds, intercalation compounds, and solid solutions of colored organic metal compounds which contains a nickel salt or nickel complex of an azobarbituric acid or its tautomer. 4,622,391, Cl. 534-707.000.

Lorenzo Barroso, Angel. Multiple, longitudinal folding apparatus. 4,621,751, Cl. 223-28.000.

Lorett, Jorge A., to Borg-Warner Corporation. Pump improvement. 4,621,981, Cl. 417-83.000.

Lori, Giulio. Method of flame activation of substrates. 4,622,237, Cl. 427-40.000.

Loveland, Steven R., to Medex, Inc. Intracranial pressure regulating system. 4,621,647, Cl. 128-748.000.

Lowe, Arthur T.; Wilson, Syd R.; and Wu, Schyi-yi, to Motorola, Inc. Fabricating a semiconductor device with reduced gate leakage. 4,621,413, Cl. 29-571.000.

Lowrance, Eugene S., to Validec, Inc. Battery terminal. 4,622,274, Cl. 429-1.000.

Lowrie, Harman S.: *See—*
Baran, John S.; Lindberg, Thomas J.; and Lowrie, Harman S., 4,622,338, Cl. 514-460.000.

Loy, Fernand R., to U.S. Philips Corporation. Device for projecting the image of a reticle in an optical system. 4,621,902, Cl. 350-576.000.

Lu, Ning H., to International Telephone and Telegraph Corporation. Convolution processor. 4,622,649, Cl. 364-728.000.

Lubrizol Corporation, The: *See—*
Walsh, Reed H., 4,622,158, Cl. 252-49.300.

Lucas Industries public limited company: *See—*
Page, Robert P.; Cheel, John N.; Howarth, Stuart I.; and Millward, John P., 4,621,722, Cl. 192-0.055.

Lum, Richard M.: *See—*
Glass, Alastair M.; Kohl, Paul A.; Lum, Richard M.; and Ostermayer, Frederick W., Jr., 4,622,114, Cl. 204-129.300.

Lundin, Robert S., to Superior Electric Company, The. Up/down counter interface means. 4,622,686, Cl. 377-55.000.

Lundqvist, Weine, to Kamyr AB. Distributing device for suspensions. 4,621,507, Cl. 63-181.00R.

Luperti, Harry E.; and Luvara, Anthony, to Pitney Bowes Inc. Shingle compensating device. 4,621,966, Cl. 414-43.000.

Lupnitz, Gerhard: *See—*
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; Schlicht, Heribert; and Schroer, Franz-Josef, 4,621,440, Cl. 34-155.000.

Luu, Minh: *See—*
Kneidel, Kurt E.; and Luu, Minh, 4,621,838, Cl. 285-41.000.

Luvara, Anthony: *See—*
Luperti, Harry E.; and Luvara, Anthony, 4,621,966, Cl. 414-43.000.

Luxtron Corporation: *See—*
Phillips, Stephen R., 4,621,929, Cl. 374-43.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Kubis, Heribert, 4,621,594, Cl. 123-41.090.

M.C.B.: *See—*
Taillebois, Jacques A. J., 4,622,461, Cl. 250-231.0SE.

Ma, Chen-Chi M., to Phillips Petroleum Company. Stampable sheets of glass/carbon fiber mat reinforced polymers of olefin and method of preparation. 4,622,192, Cl. 264-136.000.

Mabuchi, Hiroshi, to Citizen Watch Co., Ltd. Carriage traveling mechanism for floppy disc drive. 4,622,608, Cl. 360-106.000.

Maccuaig, Stuart J. Self-retaining anchoring assembly and seal therefor. 4,621,937, Cl. 403-197.000.

MacGregor, Harvey J. Grounding electrode. 4,621,476, Cl. 52-741.000.
Machinefabriek en Technische Handelsonderneming M.H. van der Graaf B.V.: *See*—
van der Graaf, Meine H., 4,621,400, Cl. 29-123.000.
Machino, Katsuyuki: *See*—
Ise, Hasahiro; Tanaka, Hidehiko; Machino, Katsuyuki; Matsubara, Toshiyuki; and Terasaka, Teiji, 4,622,535, Cl. 340-310.00R.
Ise, Masahiro; Tanaka, Hidehiko; Machino, Katsuyuki; Matsubara, Toshiyuki; and Terasaka, Teiji, 4,622,478, Cl. 307-354.000.
Machlett Laboratories, Inc., The: *See*—
Budelman, Frederick T., Jr., 4,622,500, Cl. 318-341.000.
Macho, Dale C.: *See*—
Dillard, Lathe T.; and Macho, Dale C., 4,621,957, Cl. 408-93.000.
Mack, Claude M.: *See*—
Stickels, Charles A.; and Mack, Claude M., 4,622,081, Cl. 420-111.000.
Mack, Ernst: *See*—
Sonneborn, Siegfried; Handel, Manfred; and Mack, Ernst, 4,621,466, Cl. 52-15.000.
Mack, Jory B., to Pamco Label Co. Simplified multilayer label. 4,621,442, Cl. 40-2.00R.
Mack, Jory B., to Pamco Label Co. Multi-layered label. 4,621,837, Cl. 283-105.000.
Mackay, Malcolm D., to Standard Telephones and Cables Public Limited Company. Optical fibre manufacture. 4,622,242, Cl. 427-163.000.
Mader, Roger A.: *See*—
Bellus, Peter A.; and Mader, Roger A., 4,622,395, Cl. 544-37.000.
Maeda, Hisashi: *See*—
Ikehata, Norimitsu; Kobayashi, Kiyoshi; and Maeda, Hisashi, 4,622,592, Cl. 358-257.000.
Maeda, Ikuo: *See*—
Shimamura, Yukio; Tsukuda, Yoshihiro; and Maeda, Ikuo, 4,622,640, Cl. 364-483.000.
Maeda, Isami: *See*—
Tachikawa, Shinziro; Hada, Chikao; and Maeda, Isami, 4,621,512, Cl. 72-325.000.
Maeda, Kunio: *See*—
Nishimura, Akira; Maeda, Kunio; and Kito, Kazuo, 4,622,254, Cl. 428-102.000.
Maeda, Yoshinobu: *See*—
Fujiwara, Koji; and Maeda, Yoshinobu, 4,621,406, Cl. 29-564.200.
Maekawa, Yukio: *See*—
Yokoyama, Shigeki; Yamanouchi, Junichi; Yoneyama, Masakazu; and Maekawa, Yukio, 4,622,288, Cl. 430-527.000.
Magid, David J., to Enviro-Spray Systems, Inc. Inflatable pouch and method of manufacture. 4,621,483, Cl. 53-455.000.
Magnetics International, Inc.: *See*—
Kluessendorf, Timothy J., 4,622,532, Cl. 335-292.000.
Magnusson, Sven-Ake, to Wicanders AB. Closure head for securing a sealing cap to a container. 4,621,481, Cl. 53-345.000.
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Mancusi, Joseph J., Jr. Aerated soapholder. 4,621,730, Cl. 206-77.100.
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Christiansen, Richard L.; and Kim, Hiemi, 4,621,522, Cl. 73-61.00R.
Margraf, Adolf. Stratified bulk material filter. 4,622,052, Cl. 55-479.000.
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Marshall, Peter W.; and Johnson, Paul R., to Shell Oil Company. Buoyant tower flexure joint. 4,621,949, Cl. 405-202.000.
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Martin, Gary D., to AT&T Bell Laboratories. Error-correction coding for multilevel transmission system. 4,622,670, Cl. 371-43.000.
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Komatsu, Yuichiro; and Maruyama, Toshio, 4,621,463, Cl. 51-281.00C.
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Springer, Timothy J., 4,621,781, Cl. 248-118.000.
Marvin Glass & Associates: *See*—
Katzman, Allison W.; Rosenwinkel, Donald A.; and Kuna, Wayne A., 4,622,019, Cl. 446-153.000.
Marvin, Richard H.: *See*—
Bullock, Michael K.; Hedrick, Dennis R.; Marvin, Richard H.; and James, Edmund H., III, 4,621,756, Cl. 226-76.000.
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Masada, Daizo, to USM Corporation. Automatic board loaders. 4,621,967, Cl. 414-225.000.
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Matsen, Marc R., to Boeing Company, The. Method of inductively brazing honeycomb panels. 4,622,445, Cl. 219-10.410.
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Matteau, Michel; Braun, Howard R.; and Gardner, Christopher L., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Lithium battery protection circuit. 4,622,508, Cl. 320-13.000.

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McClure, Jack A., to Inland Container Corporation. Triple-end container and blank therefor. 4,621,766, Cl. 229-52.00B.

McDaniel, Max P., to Phillips Petroleum Company. Olefin polymerization. 4,622,371, Cl. 526-117.000.

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McGill, Leland S., to Kinney, Richard G. Toilet assemblies. 4,621,380, Cl. 4-476.000.

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McGuth, Joseph C., to Foster Wheeler Energy Corporation. Anti-erosion protrusions for wear surfaces in fluid conduits. 4,621,953, Cl. 406-193.000.

McInerney, Michael J., to Vapor Corporation. Boiler having improved heat absorption. 4,621,592, Cl. 122-250.00R.

McInnes, Malcolm B., to Pyrox Limited. Heat engine. 4,621,497, Cl. 60-519.000.

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McKenzie, William P., to W/S Group Inc. Mountable and demountable partition structure for motor vehicles. 4,621,856, Cl. 296-24.00R.

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McKoy, Vincent; and Gupta, Amitave, to Barnes Engineering Company. Transparent protective laser shield. 4,622,174, Cl. 252-582.000.

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Duggan, Angelina J., 4,622,408, Cl. 548-533.000.
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Newell, Harold R., 4,621,557, Cl. 84-1.190.

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Wang, Joseph Y., 4,622,207, Cl. 422-56.000.
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Mitsubishi Chemical Industries Ltd.: *See*—
Kinugasa, Kazumasa; Tanaka, Eiichiro; Tanaka, Yoshihiro; and Morita, Yoshiharu, 4,622,181, Cl. 260-397.400.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Isozaki, Shin; Sasaki, Masaru; and Hosaka, Shuroku, 4,622,601, Cl. 360-48.000.
Makigawa, Yasuyuki, 4,622,610, Cl. 360-92.000.
Mori, Sadao; Yorozuya, Tsuruo; Wada, Yuichi; and Shinozaki, Yasuhide, 4,622,533, Cl. 337-114.000.
Nakamura, Toshiyuki; Sugihara, Masahiro; Inaba, Tsutomu; and Kimura, Tadashi, 4,621,993, Cl. 418-55.000.
Shimomura, Setsuhiro, 4,622,126, Cl. 204-425.000.
Tanaka, Naoki, 4,621,501, Cl. 62-199.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kozuka, Hajime, 4,621,704, Cl. 180-143.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Tanaka, Akira; and Miura, Hidetoshi, 4,622,290, Cl. 430-574.000.
Mitsubishi Plastics Industries Limited: *See*—
Hirobe, Kiyokazu; and Tsujii, Naokuni, 4,621,450, Cl. 47-58.000.
Mitsuhashi, Yasuo: *See*—
Imai, Eiichi; Kobayashi, Hiroyuki; and Mitsuhashi, Yasuo, 4,622,281, Cl. 430-107.000.
Mitsui Mining & Smelting Co.: *See*—
Motoki, Ryozo; Motoishi, Shoji; Izumo, Mishiroku; Onoma, Katsuyuki; and Sato, Toshikazu, 4,622,176, Cl. 252-631.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, 4,622,268, Cl. 428-480.000.
Mitsui Toatsu Chemical Inc.: *See*—
Gomi, Tadashi; Sakata, Kenji; Aoyama, Ichiro; and Sono, Nobuo, 4,622,360, Cl. 524-507.000.
Miura, Hidetoshi: *See*—
Tanaka, Akira; and Miura, Hidetoshi, 4,622,290, Cl. 430-574.000.
Miura, Seishi, to Nittan Valve Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaiska. Hydraulic lash adjustor in a valve operating mechanism. 4,621,598, Cl. 123-90.460.
Mixalloy Limited: *See*—
Bellis, John; and Mathers, Roy, 4,622,189, Cl. 264-112.000.
Miyama, Hiroshi; Kawauchi, Yoshikazu; Tomii, Kaoru; and Nishida, Jun, to Matsushita Electric Industrial Co., Ltd. Flat type cathode ray tube. 4,622,497, Cl. 315-366.000.
Miyashige, Toshun; Sakata, Masataka; and Asano, Masakazu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Pressure oil line system for a fork lift truck. 4,621,711, Cl. 187-9.00E.
Miyashita, Tsune; Yasuda, Makoto; Murayama, Seiichi; and Arai, Yoji, to Hitachi, Ltd. Discharge lamp with neon gas in outer tube. 4,622,485, Cl. 313-25.000.
Miyata, Hiroshi: *See*—
Nakashima, Noriyuki; Ishiguro, Yoshinori; Kamiya, Kohji; Miyata, Hiroshi; Nakamura, Kazumasa; and Sugimoto, Naoyasu, 4,621,832, Cl. 280-707.000.
Miyoshi Kasei Co., Ltd.: *See*—
Miyoshi, Ryota; and Imai, Isao, 4,622,074, Cl. 106-308.00F.
Miyoshi, Ryota; and Imai, Isao, to Miyoshi Kasei Co., Ltd. Pigments and extender pigments which are surface-treated with hydrogenated lecithin, and cosmetics containing the same. 4,622,074, Cl. 106-308.00F.
Mizuno, Toshinao, to Kabushiki Kaisha Saikousha. Combination locking device having removable U-shaped retaining rod. 4,621,509, Cl. 70-26.000.
Mizunuma, Sinji; Sunada, Masayoshi; and Higuchi, Shigemitsu, to Hitachi, Ltd. Head positioning system for magnetic recording/-playback apparatus. 4,622,603, Cl. 360-78.000.
Mizusawa Kagaku Kogyo Kabushiki Kaisha: *See*—
Nakazawa, Tadahisa; Usui, Koichi; Ogawa, Masahide; Abe, Kiyoshi; and Tokita, Takashi, 4,622,166, Cl. 252-313.100.
Mizutani, Hiroyuki: *See*—
Fukuhara, Yuichi; Mizutani, Hiroyuki; and Fuchigami, Takeshi, 4,621,707, Cl. 180-247.000.
Mizutani, Michitaka, to Kyocera Corporation. Process for preparation sintered silicon nitride body having surface compression stress. 4,622,186, Cl. 264-62.000.
Mizutani, Morikazu: *See*—
Nitanda, Hiroshi; Mizutani, Morikazu; Yokoyama, Taketoshi; Tamai, Jun; and Okumura, Toru, 4,621,919, Cl. 355-3.0DR.
Mobay Chemical Corporation: *See*—
Anderson, Howard A., 4,621,940, Cl. 404-10.000.
Mobil Oil Corporation: *See*—
Dotson, Billy J., 4,622,643, Cl. 364-556.000.
Olson, Robert H., 4,621,732, Cl. 206-346.000.
Page, Ronald D., 4,621,946, Cl. 405-61.000.
Wilson, Peggy M.; and Muegge, Ernest L., 4,621,694, Cl. 166-312.000.
Mohl, Helmut, to Robert Bosch GmbH. Method and apparatus for controlling an automotive drive system with free-wheeling. 4,621,545, Cl. 74-866.000.
Mohri, Motoo; and Tajima, Yoshimitsu, to Sharp Kabushiki Kaisha. Hydrogen-stored electrode for use in battery and manufacturing method. 4,621,417, Cl. 29-623.100.

Moiseiev, Jurij V.: *See*—
Horak, Daniel; Metalova, Marie; Svec, Frantisek; Drobnik, Jaroslav; Kalal, Jaroslav; Kuzin, Michail I.; Adamian, Arnold A.; Moiseiev, Jurij V.; and Gumargalieva, Klara Z., 4,622,367, Cl. 525-381.000.
Molex Incorporated: *See*—
Slavicek, Donald, 4,621,486, Cl. 53-580.000.
Molins Machine Co., Inc.: *See*—
Dyett, Derek H.; and Soborowski, Michael J., 4,621,650, Cl. 131-282.000.
Molins PLC: *See*—
Williamson, David T. N., 4,621,410, Cl. 29-568.000.
Moller, Knut: *See*—
Borowski, Horst; Moller, Knut; Wiethaup, Wolfgang; Rodemeyer, Gunther; Henning, Paul-Georg; and Kohn, Erhard, 4,621,651, Cl. 131-361.000.
Moncur, Marlowe V., to Swedlow, Inc. Plastic transparency and method for making it. 4,622,377, Cl. 526-323.200.
Mondshine, Thomas C., to Texas United Chemical Corp. Water soluble perforation pack. 4,621,692, Cl. 166-281.000.
Monitor Engineers Limited: *See*—
Carr, Michael J. R.; Sennett, Colin; Wilkinson, Brian; and Winn, Russell E., deceased, 4,621,562, Cl. 89-41.050.
Monsanto Company: *See*—
Alt, Gerhard H., 4,622,061, Cl. 71-88.000.
Dyson, William; and Rossi, Jon A., 4,622,082, Cl. 148-33.000.
Montagner, Enzo: *See*—
Munari, Fausto; Tosi, Bruno; Trestianu, Sorin; and Montagner, Enzo, 4,621,534, Cl. 73-864.860.
Montanwerke Walter GmbH: *See*—
Tollner, Klaus, 4,621,960, Cl. 409-232.000.
Moore, Bruce D., to Raytheon Company. Switching regulator. 4,622,511, Cl. 323-282.000.
Moore Business Forms, Inc.: *See*—
Soltysiak, John R.; and Harrod, Jimmie A., 4,621,556, Cl. 83-670.000.
Moore, Byron E.: *See*—
Ball, Gregory A.; Moore, Byron E.; and Beam, Hoyt W., 4,621,585, Cl. 112-10.000.
Mooz, Dietrich, to Felten & Guilleaume Energietechnik GmbH. Single-pole load disconnecting switch arrangement in a housing. 4,622,443, Cl. 200-50.00R.
Morand, Jean: *See*—
Doyhamboure, Francois; and Morand, Jean, 4,621,780, Cl. 244-118.200.
Morgan, Thomas E., to Minnesota Mining and Manufacturing Company. Connector with strain relief. 4,621,886, Cl. 339-107.000.
Mori, Sadao; Yorozuya, Tsuruo; Wada, Yuichi; and Shinozaki, Yasuhide, to Mitsubishi Denki Kabushiki Kaisha. Self-recovery type current limiting element. 4,622,533, Cl. 337-114.000.
Mori, Shinji; and Tamura, Keiichi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Mounting construction of webbing retractor. 4,621,836, Cl. 280-807.000.
Mori, Takanobu; Kashimura, Tetsuo; Fukui, Yutaka; Yanai, Yoshimi; and Iizuka, Nobuyuki, to Hitachi, Ltd. Gas turbine combustor. 4,621,499, Cl. 60-752.000.
Mori, Takanobu: *See*—
Takahashi, Yoshinobu; Mori, Takanobu; Odanaka, Masamitsu; Murase, Haruo; and Kojima, Masayuki, 4,621,420, Cl. 29-856.000.
Moriguchi, Haruhiko: *See*—
Hisatake, Masayuki; Moriguchi, Haruhiko; Inui, Toshiharu; and Noguchi, Akio, 4,622,595, Cl. 358-296.000.
Moriki, Yasumitsu; Tanaka, Akira; and Takahashi, Izumi, to Maruma Jyusharyo Kabushiki Kaisha. Method of discriminating fitting pressure for links on a track press. 4,621,491, Cl. 59-7.000.
Moriki, Yasumitsu; and Sakurai, Masahiro, to Maruma Jyusharyo Kabushiki Kaisha. Apparatus for rebuilding worn shoe grouser for track chain. 4,622,451, Cl. 219-76.100.
Morimoto, Kiyoshi; and Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Boron nitride film and process for preparing same. 4,622,236, Cl. 427-38.000.
Morita, Yoshiharu: *See*—
Kinugasa, Kazumasa; Tanaka, Eiichiro; Tanaka, Yoshihiro; and Morita, Yoshiharu, 4,622,181, Cl. 260-397.400.
Moritsu, Yukikazu: *See*—
Akai, Yoshito; Konaga, Nobuyuki; Arisato, Yasunori; Wada, Masatoshi; and Moritsu, Yukikazu, 4,622,069, Cl. 106-1.110.
Morris, David L.: *See*—
Ellis, Paul B.; and Morris, David L., 4,622,293, Cl. 435-7.000.
Morris, Gareth W.: *See*—
Comyns, Alan E.; Morris, Gareth W.; and Sankey, John P., 4,622,214, Cl. 423-277.000.
Morrison, Daniel P.: *See*—
Qureshi, Gulzar A.; Morrison, Daniel P.; Hijuelos, Humberto A.; and Vollmuth, Lawrence P., 4,621,399, Cl. 29-33.00D.
Morrison, William C., to AE PLC. Machining workpieces. 4,621,546, Cl. 82-1.00C.
Mortier, Rene E. J.: *See*—
Vanelderen, Yvon L.; Raskin, Christian L. G.; Mortier, Rene E. J.; and Dompas, John M. A., 4,621,675, Cl. 164-481.000.
Morz, Gunter, to ANT Nachrichtentechnik GmbH. Dual band polarization filter comprising orthogonally oriented fin-type conductors. 4,622,524, Cl. 333-126.000.
Moses, Peter R.: *See*—
Bedder, Paul L.; Moses, Peter R.; Patel, Bhupendra; Reise, Terrence F.; and Taylor, Alwyn H., 4,622,277, Cl. 429-94.000.
MOTAN Gesellschaft mit beschrankter Haftung: *See*—
Roth, Paul, 4,622,003, Cl. 431-1.000.
Motika, Gabor: *See*—
Bernath, Gabor; Kobor, Jeno ; Lazar, Janos; Motika, Gabor; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , 4,622,329, Cl. 514-307.000.
Motoishi, Shoji: *See*—
Motoki, Ryozo; Motoishi, Shoji; Izumo, Mishiroku; Onoma, Katsuyuki; and Sato, Toshikazu, 4,622,176, Cl. 252-631.000.
Motoki, Masanobu: *See*—
Matsuo, Nobutaka; Itoh, Yoshitaka; Kanbe, Sadao; Osafune, Haruo; and Motoki, Masanobu, 4,622,056, Cl. 65-18.100.
Motoki, Ryozo; Motoishi, Shoji; Izumo, Mishiroku; Onoma, Katsuyuki; and Sato, Toshikazu, to Japan Atomic Energy Research Institute; and Mitsui Mining & Smelting Co. Method of processing radioactive liquid wastes containing radioactive ruthenium. 4,622,176, Cl. 252-631.000.
Motorola, Inc.: *See*—
Doggett, John G.; Jones, John M.; and Waddoups, Ray O., 4,622,555, Cl. 342-84.000.
Ganger, Jeffrey D., 4,622,482, Cl. 307-585.000.
Lester, Theodore V., 4,622,498, Cl. 315-382.000.
Lowe, Arthur T.; Wilson, Syd R.; and Wu, Schyi-yi, 4,621,413, Cl. 29-571.000.
Pri-Tal, Shlomo, 4,622,669, Cl. 371-25.000.
Shekerjian, Hart, 4,622,434, Cl. 174-52.00H.
Whiting, Douglas L., 4,622,695, Cl. 455-58.000.
Motsko, Gerard J. Reflective/refractive/reflective precision connector, (MR3PC). 4,621,895, Cl. 350-96.210.
Mouroulis, Pantazis: *See*—
Failes, Michael; and Mouroulis, Pantazis, 4,622,460, Cl. 250-227.000.
Moutonnier, Claude: *See*—
Parge, Daniel; Le Roy, Pierre; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,622,393, Cl. 540-215.000.
Mowles, Thomas F.: *See*—
Felix, Arthur M.; Heimer, Edgar P.; and Mowles, Thomas F., 4,622,312, Cl. 514-12.000.
Moyer Diebel Limited: *See*—
Diebel, Howard, 4,622,102, Cl. 202-185.300.
Moyer, Jesse R., to Exotic Metals, Inc. Indexed lapping machine. 4,621,457, Cl. 51-59.00R.
Mrozek, Eric M.: *See*—
Basham, Jack K.; Ho, Kenton T. T.; and Mrozek, Eric M., 4,622,683, Cl. 375-90.000.
MTS Vektronics Corporation: *See*—
Eaton, Homer L.; and Shaylor-Billings, John D., 4,622,462, Cl. 250-236.000.
Muacevic, Gojko: *See*—
Casals-Stenzel, Jorge; Weber, Karl-Heinz; Walther, Gerhard; Harreus, Albrecht; and Muacevic, Gojko, 4,622,319, Cl. 514-220.000.
Muegge, Ernest L.: *See*—
Wilson, Peggy M.; and Muegge, Ernest L., 4,621,694, Cl. 166-312.000.
Mueller, Robin R., to R-Jayco Ltd. Therapeutic roller/walker. 4,621,804, Cl. 272-70.300.
Muenzner, Wulf: *See*—
Fitterer, Horst; Roos, Roland; Muenzner, Wulf; Balz, Werner; and Berger, Heinz, 4,621,779, Cl. 242-199.000.
Mukasa, Koichi: *See*—
Nakashima, Keishi; Hatanai, Takashi; and Mukasa, Koichi, 4,622,273, Cl. 428-668.000.
Mulhollan, James S.; and Starr, Lionel. Mechanical needle carrier and method for its use. 4,621,640, Cl. 128-340.000.
Muller, Dietmar; Krohnert, Rudolf; and Franken, Harald, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e. Apparatus for producing propellant charge powder in the form of strands. 4,622,000, Cl. 425-467.000.
Muller, Peter: *See*—
Simon, Bernd; Dammann, Hanns-Gerd; Muller, Peter; Legeler, Hans-Jurgen; Orth, Dieter; and Radunz, Hans-Eckart, 4,622,316, Cl. 514-162.000.
Muller, Raymond J.: *See*—
Salem, Eli; Muller, Raymond J.; and Stracey, Stanley T., 4,622,141, Cl. 210-189.000.
Multi-Arc Vacuum Systems, Inc.: *See*—
Bergman, Clark; and Vergason, Gary E., 4,622,452, Cl. 219-121.0PR.
Munari, Fausto; Tosi, Bruno; Trestianu, Sorin; and Montagner, Enzo, to Carlo Erba Strumentazione S.p.A. Automatic sample apparatus, valve and sampling method. 4,621,534, Cl. 73-864.860.
Munemura, Koutaro: *See*—
Koikeda, Minoru; Suzuki, Takashi; Munemura, Koutaro; Nishimoto, Yoshihiko; and Imai, Tetsuya, 4,622,308, Cl. 502-66.000.
Murakami, Masaki: *See*—
Satoh, Takao; Murakami, Masaki; Kawasaki, Nobuhiro; Ichisaka, Teruo; and Katayama, Shinji, 4,622,113, Cl. 204-98.000.
Murano, Kanji; Nishigaki, Susumu; Himuro, Masami; and Watanabe, Yoshihisa, to Sony Corporation. Electro-optic light shutter. 4,621,903, Cl. 350-390.000.
Murasaki, Shigeru; Hattori, Motonobu; Ishibashi, Akira; and Nandoh, Kenji, to Hitachi, Ltd. PWM inverter apparatus with digital control. 4,622,628, Cl. 363-37.000.

Murase, Haruo: *See*—
Takahashi, Yoshinobu; Mori, Takanobu; Odanaka, Masamitsu; Murase, Haruo; and Kojima, Masayuki, 4,621,420, Cl. 29-856.000.
Murayama, Seiichi: *See*—
Miyashita, Tsune; Yasuda, Makoto; Murayama, Seiichi; and Arai, Yoji, 4,622,485, Cl. 313-25.000.
Yasuda, Makoto; and Murayama, Seiichi, 4,622,493, Cl. 313-642.000.
Murex Limited: *See*—
Rowe, Charles E. D.; and Hinch, George R., 4,622,068, Cl. 75-245.000.
Musacchia, John. Broadhead arrow with axial alignment device. 4,621,817, Cl. 273-421.000.
Muschelknautz, Edgar: *See*—
Bueb, Michael; Paulini, Dieter; Muschelknautz, Edgar; Wagner, Wolfram; and Groschel, Herbert, 4,622,195, Cl. 264-168.000.
Musso, Pietro, to Ing. C. Olivetti & C., S.p.A. Line spacing mechanism for printing machines. 4,621,933, Cl. 400-555.000.
Mykleby, Laurie G., to CVP Systems, Inc. Collapsible bag and liner combination. 4,622,693, Cl. 383-119.000.
Nadolny, Kurt: *See*—
Schulz, Rene ; Braum, Heinrich J.; Nadolny, Kurt; and Nguyen, Van-Trung, 4,621,982, Cl. 417-201.000.
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. 4-(2-fluoro-4-halo-5-substituted phenyl)urazols, and herbicidal use. 4,622,063, Cl. 71-92.000.
Nagasaki, Nobuo: *See*—
Noguchi, Yoshiki; Arakawa, Tadao; Nagasaki, Nobuo; Sugita, Shigehisa; and Takeuchi, Masato, 4,622,275, Cl. 429-19.000.
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Automatic dimmer for endoscope. 4,622,584, Cl. 358-98.000.
Nagasawa, Takeshi; Nakamura, Yoshio; Enomoto, Tsuyoshi; and Kuroiwa, Katsumasa, to Nitto Poseki Co., Ltd. Novel substrate for determining the activity of blood coagulation factor Xa (Stuart-Prower factor). 4,622,389, Cl. 530-331.000.
Nagoya General Bond Co. Ltd.: *See*—
Yamada, Shingo; and Yamada, Kazuo, 4,622,085, Cl. 156-94.000.
Naitoh, Shinji: *See*—
Takagi, Atsushi; Izumi, Shigeru; Takahashi, Fuminobu; Sato, Chikara; Naitoh, Shinji; and Sonoda, Shinji, 4,621,532, Cl. 73-623.000.
Nakagawa, Katsutoshi. Fishing hook. 4,621,449, Cl. 43-44.830.
Nakai, Masaaki: *See*—
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,621,914, Cl. 354-21.000.
Nakajima, Yuji: *See*—
Chikano, Mitsuo; and Nakajima, Yuji, 4,621,889, Cl. 350-1.600.
Nakamoto, Yasunobu, to Kabushiki Kaisha Toshiba. Solar pond and method of establishing the same. 4,621,612, Cl. 126-415.000.
Nakamura, Kazumasa: *See*—
Nakashima, Noriyuki; Ishiguro, Yoshinori; Kamiya, Kohji; Miyata, Hiroshi; Nakamura, Kazumasa; and Sugimoto, Naoyasu, 4,621,832, Cl. 280-707.000.
Nakamura, Takashi: *See*—
Kihara, Taku; and Nakamura, Takashi, 4,622,581, Cl. 358-51.000.
Nakamura, Toshiyuki; Sugihara, Masahiro; Inaba, Tsutomu; and Kimura, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Scroll-type positive fluid displacement apparatus with oil compartment plate. 4,621,993, Cl. 418-55.000.
Nakamura, Yoshio: *See*—
Nagasawa, Takeshi; Nakamura, Yoshio; Enomoto, Tsuyoshi; and Kuroiwa, Katsumasa, 4,622,389, Cl. 530-331.000.
Nakamura, Yuzo; Yamamoto, Soji; Sakai, Mitsugu; and Uchino, Fumio, to Olympus Optical Co., Ltd. Ultrasonic microscope. 4,621,531, Cl. 73-606.000.
Nakano, Takayuki: *See*—
Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, 4,622,268, Cl. 428-480.000.
Nakao, Takeshi: *See*—
Kaku, Toshimitsu; Nakao, Takeshi; and Tsunoda, Yoshito, 4,622,564, Cl. 346-160.000.
Nakashima, Keishi; Hatanai, Takashi; and Mukasa, Koichi, to Alps Electric Co., Ltd. Recording medium for perpendicular magnetization. 4,622,273, Cl. 428-668.000.
Nakashima, Noriyuki; Ishiguro, Yoshinori; Kamiya, Kohji; Miyata, Hiroshi; Nakamura, Kazumasa; and Sugimoto, Naoyasu, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Shock absorber control system. 4,621,832, Cl. 280-707.000.
Nakatsuji, Hiroshi: *See*—
Asano, Takeshi; Okada, Tsuneyoshi; and Nakatsuji, Hiroshi, 4,622,385, Cl. 528-491.000.
Nakayama, Takuo: *See*—
Tsukagoshi, Minoru; Nakayama, Takuo; Minagawa, Masahiko; and Yoshida, Shuji, 4,622,097, Cl. 156-644.000.
Nakazawa, Tadahisa; Usui, Koichi; Ogawa, Masahide; Abe, Kiyoshi; and Tokita, Takashi, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Process for preparation of zeolite slurry excellent in static stability and dynamic stability. 4,622,166, Cl. 252-313.100.
Namba, Yuzaburo; and Takahashi, Toshio, to Eisai Co., Ltd. Optical continuous measuring apparatus for reaction-liquid. 4,622,208, Cl. 422-65.000.
Nandoh, Kenji: *See*—
Murasaki, Shigeru; Hattori, Motonobu; Ishibashi, Akira; and Nandoh, Kenji, 4,622,628, Cl. 363-37.000.
Nannini, Luciano: *See*—
Aiuola, Franco; and Nannini, Luciano, 4,621,480, Cl. 53-234.000.
Napco Security Systems, Inc.: *See*—
Stockdale, Roy, 4,622,541, Cl. 340-566.000.
Nardi, Alain; and Simier, Jean-Noel, to Societe Chimique des Charbonnages-CdF Chimie. Process and apparatus for reducing the chances of ignition and explosion due to the decomposition of high-pressure industrial process gases. 4,622,209, Cl. 422-112.000.
Narusewicz, Michael A.: *See*—
Coon, Dennis C.; Narusewicz, Michael A.; and Sanders, Ward L., 4,621,735, Cl. 206-438.000.
Naruto, Eiro; and Masachika, Hiroshi, to Kumahira Safe Co. Inc. After hour depository. 4,622,456, Cl. 235-379.000.
Naruto, Shunji: *See*—
Terada, Atsusuke; Naruto, Shunji; and Iizuka, Yoshio, 4,622,421, Cl. 562-491.000.
Naslund, Edwin N., to Cal-Wood Door. Sound attenuating partitions and acoustical doors. 4,621,709, Cl. 181-284.000.
National Distillers and Chemical Corporation: *See*—
Hanes, Ronnie M.; and Baugh, William D., 4,622,416, Cl. 560-114.000.
National Research Development Corporation: *See*—
Elliott, Michael; Janes, Norman F.; and Pulman, David A., 4,622,337, Cl. 514-461.000.
National Semiconductor Corporation: *See*—
Buynoski, Matthew S., 4,622,576, Cl. 357-71.000.
National Starch and Chemical Corporation: *See*—
Iovine, Carmine P.; Palmer, Joseph G.; and Walker, James L., 4,622,374, Cl. 526-263.000.
National Union Electric Corporation: *See*—
Hampton, Leonard; and Hohulin, Samuel E., 4,621,390, Cl. 15-351.000.
Naturin-Werk Becker & Co.: *See*—
Crevasse, Gary A.; Gammon, David L.; and Sullivan, Michael J., 4,621,482, Cl. 53-439.000.
Naunapper, Dietmar C.: *See*—
Grande, Robert; de Kluizenaar, Cornelis J.; Naunapper, Dietmar C.; and Wehrle, Karlheinz J., 4,621,437, Cl. 34-10.000.
Neapco, Inc.: *See*—
Diffenderfer, Harold R.; and Rowley, George S., 4,622,022, Cl. 464-162.000.
NEC: *See*—
Mito, Ikuo, 4,622,674, Cl. 372-45.000.
NEC Corporation: *See*—
Aiko, Shinichi, 4,622,537, Cl. 340-347.0DD.
Okihara, Naoto; Aihara, Yoshiki; and Wakamatsu, Kazutoshi, 4,622,484, Cl. 310-328.000.
Suzuki, Shunichi, 4,622,655, Cl. 365-149.000.
Uda, Yoshihiro, 4,622,477, Cl. 307-311.000.
Neel, Henri; and Delannoy, Francis, to Atochem. Process for the recovery of ethylene glycol in concentrated form. 4,622,104, Cl. 203-18.000.
Neff, Roger E.: *See*—
Jarovitzky, Peter A.; and Neff, Roger E., 4,622,356, Cl. 524-100.000.
Nejame, Samuel, Jr., to Ionics, Incorporated. Device for compressing a pair of plates. 4,622,123, Cl. 204-299.00R.
Nellcor Incorporated: *See*—
New, William, Jr.; and Corenman, James E., 4,621,643, Cl. 128-633.000.
Neumann, Gerhard; and Ramisch, Hans, to Otto Dunkel GmbH Fabrik fur Elektrotechnische Gerate. Method of manufacturing contact spring sockets. 4,621,422, Cl. 29-882.000.
Neumann, Stefan: *See*—
Gunther, Helmut; Neumann, Stefan; and Simon, Helmut, 4,622,301, Cl. 435-146.000.
Neuner, Otto: *See*—
Blank, Heinz U.; Wolters, Erich; and Neuner, Otto, 4,622,429, Cl. 568-428.000.
New, William, Jr.; and Corenman, James E., to Nellcor Incorporated. Calibrated optical oximeter probe. 4,621,643, Cl. 128-633.000.
Newell, Harold R., to Mesur-Matic Electronics Corp. Electronic musical instrument. 4,621,557, Cl. 84-1.190.
Nguyen, Van-Trung: *See*—
Schulz, Rene ; Braum, Heinrich J.; Nadolny, Kurt; and Nguyen, Van-Trung, 4,621,982, Cl. 417-201.000.
NHK Spring Co., Ltd.: *See*—
Takadera, Ichiro; and Kuroda, Shigeru, 4,621,831, Cl. 280-689.000.
Nichias Corporation: *See*—
Sakurai, Seiji; and Umino, Kaoru, 4,622,070, Cl. 106-38.220.
Nichols, David B., Jr., to RCA Corporation. Textile dyeing process. 4,622,040, Cl. 8-478.000.
Nichols, David B., Jr., to RCA Corporation. Textile dyeing process. 4,622,041, Cl. 8-478.000.
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Nicolas, Jacques: *See*—
Castera, Andre ; Nicolas, Jacques; and Buvat, Jean, 4,621,580, Cl. 102-334.000.

Nicoud, Jean-Francois; and Zyss, Joseph. N-(4-nitrophenyl)-2-(hydroxymethyl)-pyrrolidine and deuterated derivatives thereof. 4,622,409, Cl. 548-570.000.

Niewohner, Ulrich: *See*—
Lieb, Folker; Oediger, Hermann; Kabbe, Hans-Joachim; Niewohner, Ulrich; Perzborn, Elisabeth; and Seuter, Friedel, 4,622,339, Cl. 514-563.000.

Nihon Radiator Co., Ltd.: *See*—
Ikuta, Shiro; and Homma, Koji, 4,621,687, Cl. 165-152.000.

Nihon Tokushu Noyaku Seizo K. K.: *See*—
Saito, Junichi; Kurahashi, Yoshio; Goto, Toshio; and Yamaguchi, Naoko, 4,622,064, Cl. 71-92.000.

Niimi, Hiroshi: *See*—
Kawabata, Susumu; Niimi, Hiroshi; Anahara, Meiji; and Omori, Hiroshi, 4,621,490, Cl. 57-328.000.

Nilsson, Mary, Goran Nilsson, heirs: *See*—
Nilsson, Vilgot, deceased, 4,622,029, Cl. 494-2.000.

Nilsson, Vilgot, deceased (by Nilsson, Mary, Goran Nilsson, heirs), to Alfa-Laval Marine and Power Engineering AB. Arrangement in connection with a centrifugal separator. 4,622,029, Cl. 494-2.000.

Nippon Electric Co., Ltd.: *See*—
Hara, Toshio, 4,622,571, Cl. 357-42.000.

Nippon Kodoshi Corporation: *See*—
Tanouchi, Tatsuji; Ushimoto, Junichi; Okabayashi, Satoru; and Ikegawa, Toshio, 4,622,612, Cl. 361-433.000.

Nippon Kogaku K.K.: *See*—
Hamanishi, Yoshinari, 4,621,909, Cl. 350-464.000.

Nippon Paint Co., Ltd.: *See*—
Furuno, Nobuo, 4,622,133, Cl. 210-96.200.

Nippon Seiko K.K.: *See*—
Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,621,702, Cl. 180-140.000.

Nippon Soken, Inc.: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; and Takeuchi, Yasuhiro, 4,621,599, Cl. 123-300.000.

Nippon Steel Corporation: *See*—
Kokai, Katsuaki; and Ohta, Takeo, 4,621,794, Cl. 266-256.000.

Nippon Telegraph & Telephone Public Corporation: *See*—
Uchimura, Kuniharu; and Iwata, Atushi, 4,622,480, Cl. 307-491.000.

Nippondenso Co., Ltd.: *See*—
Nakashima, Noriyuki; Ishiguro, Yoshinori; Kamiya, Kohji; Miyata, Hiroshi; Nakamura, Kazumasa; and Sugimoto, Naoyasu, 4,621,832, Cl. 280-707.000.

Nishida, Jun: *See*—
Miyama, Hiroshi; Kawauchi, Yoshikazu; Tomii, Kaoru; and Nishida, Jun, 4,622,497, Cl. 315-366.000.

Nishigaki, Susumu: *See*—
Murano, Kanji; Nishigaki, Susumu; Himuro, Masami; and Watanabe, Yoshihisa, 4,621,903, Cl. 350-390.000.

Nishii, Michiharu, to Aisin Seiki Kabushiki Kaisha. Force multiplying device for vehicle brake systems. 4,621,564, Cl. 91-534.000.

Nishimoto, Yoshihiko: *See*—
Koikeda, Minoru; Suzuki, Takashi; Munemura, Koutaro; Nishimoto, Yoshihiko; and Imai, Tetsuya, 4,622,308, Cl. 502-66.000.

Nishimura, Akira; Maeda, Kunio; and Kito, Kazuo, to Toray Industries, Inc. Fiber material for reinforcing plastics. 4,622,254, Cl. 428-102.000.

Nishiura, Eiichi: *See*—
Ando, Katsutoshi; Nishiura, Eiichi; and Yamamoto, Yoshiyuki, 4,622,263, Cl. 428-288.000.

Nisioka, Takasi: *See*—
Kitahara, Katsuhiko; Masutani, Tetsuya; Yamaoka, Takashi; Kitahaba, Tetsuo; Nisioka, Takasi; and Itami, Yasuo, 4,622,066, Cl. 71-98.000.

Nissan Motor Company, Limited: *See*—
Etoh, Yoshiyuki, 4,621,705, Cl. 180-169.000.
Fujita, Kazunori, 4,621,494, Cl. 60-313.000.
Matsunaga, Yukuo; and Kawasaki, Hajime, 4,621,493, Cl. 60-290.000.
Tachibana, Akira, 4,622,636, Cl. 364-424.000.

Nitanda, Hiroshi; Mizutani, Morikazu; Yokoyama, Taketoshi; Tamai, Jun; and Okumura, Toru, to Canon Kabushiki Kaisha. Metal drum and image holding member using the same. 4,621,919, Cl. 355-3.0DR.

Nittan Valve Co., Ltd.: *See*—
Miura, Seishi, 4,621,598, Cl. 123-90.460.

Nitto Poseki Co., Ltd.: *See*—
Nagasawa, Takeshi; Nakamura, Yoshio; Enomoto, Tsuyoshi; and Kuroiwa, Katsumasa, 4,622,389, Cl. 530-331.000.

Niwa, Masatake: *See*—
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,621,914, Cl. 354-21.000.

NL Industries, Inc.: *See*—
Watson, Kenneth E.; and Sharp, Keith W., 4,622,153, Cl. 252-8.514.

Nogami, Junzo: *See*—
Torii, Shigeru; Tanaka, Hideo; Nogami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,622,178, Cl. 540-358.000.

Noguchi, Akio: *See*—
Hisatake, Masayuki; Moriguchi, Haruhiko; Inui, Toshiharu; and Noguchi, Akio, 4,622,595, Cl. 358-296.000.

Noguchi, Masaro, to AMP Incorporated. Electrical connector assembly. 4,621,883, Cl. 339-60.00M.

Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Light beam scanning apparatus. 4,621,891, Cl. 350-6.200.

Noguchi, Takaharu: *See*—
Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, 4,622,600, Cl. 360-32.000.

Noguchi, Yoshiki; Arakawa, Tadao; Nagasaki, Nobuo; Sugita, Shigehisa; and Takeuchi, Masato, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Fuel cell power plant. 4,622,275, Cl. 429-19.000.

Noguchi, Yuji; and Itoh, Yuzuru, to Research Association for Residual Oil Processing. Method for the hydrogenation treatment of a heavy hydrocarbon oil. 4,622,127, Cl. 208-58.000.

Nokovich, Nick, to Westinghouse Electric Corp. Precision internal tube cutter. 4,621,549, Cl. 82-1.200.

Nomura, Hideo: *See*—
Chiba, Yasutsune; Arima, Shizuo; Nozawa, Katsumi; and Nomura, Hideo, 4,621,771, Cl. 239-585.000.

Nomura, Noboru; Kanai, Kenji; and Kauninaka, Nobuyuki, to Matsushita Electric Industrials Co., Ltd. Thin film magnetic head. 4,622,613, Cl. 360-113.000.

Nomura, Osamu: *See*—
Katsura, Yoshiro; Hagiwara, Kazuhiko; and Nomura, Osamu, 4,622,032, Cl. 604-122.000.

Noristan Limited: *See*—
Dekker, Theodor G.; Oliver, Douglas W.; Snyckers, Friedrich O.; and van der Schyf, Cornelis J., 4,622,430, Cl. 564-458.000.

North American Philips Corporation: *See*—
Eventoff, Arnold T.; and Stolfi, Fred R., 4,622,501, Cl. 318-627.000.

North China Research Institute of Electro-Optics: *See*—
Chen, Zu-fan, 4,621,642, Cl. 128-422.000.

Northern Telecom Limited: *See*—
Graves, Alan F.; Littlewood, Paul A.; and Weiss, Johannes S., 4,622,666, Cl. 370-100.000.
Kasbia, Puran S.; and Li, Yuan-Lu, 4,622,439, Cl. 379-252.000.

Northwestern University: *See*—
Wynne, Kenneth J.; Marks, Tobin J.; and Inabe, Tamotsu, 4,622,170, Cl. 252-518.000.

Norton, David E., Jr., to Storage Technology Corporation. Write data transition detector. 4,622,599, Cl. 360-31.000.

Nortrup, Kevin E., to RCA Corporation. Digital envelope detection circuit. 4,622,481, Cl. 307-522.000.

Noser, Anne M. Dental brushing aid. 4,621,387, Cl. 15-167.00R.

Novotrade RT: *See*—
Szatloczky, Erno ; Andor, Akos; Vucskits, Andras; Marai, Geza; and Palagyi nee Vajdovics, Erzsebet, 4,622,341, Cl. 514-648.000.

Nowacki, Christopher; and Brisson, Alfred G., to Trutek Research, Inc. Anesthesia tubing connections. 4,621,634, Cl. 128-204.180.

Nozawa, Katsumi: *See*—
Chiba, Yasutsune; Arima, Shizuo; Nozawa, Katsumi; and Nomura, Hideo, 4,621,771, Cl. 239-585.000.

Nozawa, Kazuo, to Diesel Kiki Co., Ltd. Heat exchanger comprising condensed moisture drainage means. 4,621,685, Cl. 165-111.000.

NRG Industries, Inc.: *See*—
Phillips, H. Verne; and Walton, Michael A., 4,621,478, Cl. 52-775.000.

Nusbaum, Franklin D., Jr.: *See*—
Adelson, Richard L.; and Nusbaum, Franklin D., Jr., 4,622,639, Cl. 364-463.000.

Nytomt, Jan G.: *See*—
Johansson, Sven H.; and Nytomt, Jan G., 4,621,881, Cl. 339-26.000.

Oates, Stephanie J.: *See*—
Misura, Michael S.; Schwarz, Richard A.; and Oates, Stephanie J., 4,622,376, Cl. 526-286.000.

Obara, Haruki: *See*—
Kinoshita, Mitsuo; and Obara, Haruki, 4,622,450, Cl. 219-69.00W.

Oberschmidt, James M.: *See*—
Fouts, David P.; Gupta, Devandra; Ho, Paul S.; Jaspal, Jasvir S.; Lloyd, James R., Jr.; Oberschmidt, James M.; Srikrishnan, Kris V.; and Sullivan, Michael J., 4,622,205, Cl. 420-566.000.

Oberview Pty. Ltd.: *See*—
Connell, Bruce R., 4,621,923, Cl. 355-133.000.

O'Brien, Robert. Flexible paint strainer. 4,622,146, Cl. 210-469.000.

Ochiai, Nobuo; and Tsumagari, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing semiconductor strain sensor. 4,622,098, Cl. 156-645.000.

Ochiai, Takeji, to Fuji Photo Film Co., Ltd. Laser recording material. 4,622,261, Cl. 428-195.000.

O'Connor, Lawrence. Pre-folded packaged tape for electrical conductors. 4,621,777, Cl. 242-1.000.

O'Connor, Stuart; Bell, Donald; and Dean, Stuart L., to International Computers Limited. Data communication system. 4,622,550, Cl. 340-825.050.

O'Connor, William, to Avco Corporation. Air inlet filter for gas turbine engine. 4,622,050, Cl. 55-283.000.

Odaka, Makoto: *See*—
Tokumo, Akio; Kunugi, Yoshiro; Yoshimi, Toshikazu; Kato, Shinjiro; Sasaki, Yoshio; Odaka, Makoto; and Sato, Takeshi, 4,622,691, Cl. 381-86.000.

Odanaka, Masamitsu: *See*—
Takahashi, Yoshinobu; Mori, Takanobu; Odanaka, Masamitsu; Murase, Haruo; and Kojima, Masayuki, 4,621,420, Cl. 29-856.000.

Oediger, Hermann: *See*—
Lieb, Folker; Oediger, Hermann; Kabbe, Hans-Joachim; Niewohner, Ulrich; Perzborn, Elisabeth; and Seuter, Friedel, 4,622,339, Cl. 514-563.000.

Oerlikon Buhrle U.S.A. Inc.: *See*—
Landau, Richard F., 4,622,122, Cl. 204-298.000.

Officine Panerai S.r.l.: *See*—
Zei, Dino, 4,622,623, Cl. 362-84.000.

Ogawa, Masahide: *See*—
Nakazawa, Tadahisa; Usui, Koichi; Ogawa, Masahide; Abe, Kiyoshi; and Tokita, Takashi, 4,622,166, Cl. 252-313.100.
Ogawa, Tomihisa: *See*—
Hashimoto, Yasuichi; and Ogawa, Tomihisa, 4,622,604, Cl. 360-78.000.
Ogino, Hiroshi: *See*—
Takeuchi, Tetsuya; Koshigoe, Katsuki; Ogino, Hiroshi; and Hayashi, Masaharu, 4,621,433, Cl. 33-286.000.
Ohkubo, Yasunori: *See*—
Suzuki, Toshihiko; Isawa, Nobuyuki; Ohkubo, Yasunori; and Hoshi, Kinji, 4,622,211, Cl. 422-248.000.
Ohlson, Johnny, to Aktiebolaget Bofors. Detonation chamber. 4,621,559, Cl. 86-50.000.
Ohmori, Akira; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, to Daikin Kogyo Co., Ltd. Fluorine-containing copolymer and composition containing the same. 4,622,364, Cl. 525-200.000.
Ohshima, Takashi: *See*—
Hino, Toshikatsu; Arase, Fumio; and Ohshima, Takashi, 4,621,419, Cl. 29-837.000.
Ohta, Norio: *See*—
Hosoe, Yuzuru; Ohta, Norio; Andoo, Keikichi; and Sugita, Yutaka, 4,622,264, Cl. 428-332.000.
Ohta, Takeo: *See*—
Kokai, Katsuaki; and Ohta, Takeo, 4,621,794, Cl. 266-256.000.
Ohwaki, Shinji: *See*—
Suzuki, Togi; Konishi, Tadashi; Iohara, Kohichi; Ohwaki, Shinji; and Yamada, Setsuo, 4,622,381, Cl. 528-295.000.
Oishi, Kengo; and Ono, Tuyoshi, to Fuji Photo Film Co., Ltd. Magnetic recording disk cartridge. 4,622,618, Cl. 360-133.000.
Okabayashi, Mitumasa; and Shiga, Norio, to Tokyo Juki Industrial Co., LTD. Device for controlling rotation of stepping motor. 4,622,505, Cl. 318-696.000.
Okabayashi, Satoru: *See*—
Tanouchi, Tatsuji; Ushimoto, Junichi; Okabayashi, Satoru; and Ikegawa, Toshio, 4,622,612, Cl. 361-433.000.
Okada, Hozuma, to Sakashita Co., Ltd. Textile fabric utilizing cored yarns. 4,621,489, Cl. 57-210.000.
Okada, Minoru, to Suzuhiro U.S.A., Inc. Process for preparing a fish meat product. 4,622,234, Cl. 426-643.000.
Okada, Tsuneyoshi: *See*—
Asano, Takeshi; Okada, Tsuneyoshi; and Nakatsuji, Hiroshi, 4,622,385, Cl. 528-491.000.
Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, to Hitachi, Ltd. Rotary-head type PCM data recording/reproducing method and apparatus with a redundancy-reduced control data format. 4,622,600, Cl. 360-32.000.
Okamoto, Jiro: *See*—
Sugo, Takanobu; Okamoto, Jiro; Ishigaki, Isao; and Katakai, Akio, 4,622,366, Cl. 525-380.000.
Oketani, Yoshio: *See*—
Hatanaka, Norio; Hata, Tautae; Oketani, Yoshio; and Kimura, Eiji, 4,621,517, Cl. 72-441.000.
Okihara, Naoto; Aihara, Yoshiki; and Wakamatsu, Kazutoshi, to NEC Corporation. Piezoelectric relay with a piezoelectric longitudinal effect actuator. 4,622,484, Cl. 310-328.000.
Okino, Tadashi: *See*—
Suga, Akira; and Okino, Tadashi, 4,622,596, Cl. 358-335.000.
Okubo, Hiroshi: *See*—
Furukawa, Shunsuke; Hattori, Yoshitsugu; Matsumoto, Yoshihiko; and Okubo, Hiroshi, 4,622,547, Cl. 340-750.000.
Okumura, Toru: *See*—
Nitanda, Hiroshi; Mizutani, Morikazu; Yokoyama, Taketoshi; Tamai, Jun; and Okumura, Toru, 4,621,919, Cl. 355-3.0DR.
Okuno Chemical Industry Co., Ltd.: *See*—
Akai, Yoshito; Konaga, Nobuyuki; Arisato, Yasunori; Wada, Masatoshi; and Moritsu, Yukikazu, 4,622,069, Cl. 106-1.110.
Okura, Zenichi: *See*—
Kawasaki, Masahiro; Okura, Zenichi; and Urano, Fumio, 4,621,918, Cl. 354-448.000.
Okutani, Norio: *See*—
Maruo, Tomohiro; Okutani, Norio; and Inoue, Toshitugu, 4,622,502, Cl. 318-640.000.
Okuyama, Takahiro: *See*—
Kawada, Keiichi; Okuyama, Takahiro; and Toki, Susumu, 4,621,597, Cl. 123-90.270.
Olds, Leonard E.: *See*—
Miller, William C.; and Olds, Leonard E., 4,622,307, Cl. 501-38.000.
O'Leary, Raymond P.: *See*—
Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,622,250, Cl. 428-35.000.
Olin Hunt Specialty Products Inc.: *See*—
Piano, Anthony M., 4,622,107, Cl. 204-15.000.
Polakovic, Frank; and Piano, Anthony M., 4,622,108, Cl. 204-15.000.
Oliver, Douglas W.: *See*—
Dekker, Theodor G.; Oliver, Douglas W.; Snyckers, Friedrich O.; and van der Schyf, Cornelis J., 4,622,430, Cl. 564-458.000.
Oliver, Larry R.: *See*—
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,622,023, Cl. 474-93.000.
Ollikainen, Jukka S.: *See*—
Berghall, Christer K.; Ollikainen, Jukka S.; and Koskivaara, Timo T., 4,621,969, Cl. 414-331.000.
O'Loughlin, Francis A., to Thomas & Betts Corporation. Method of making an electrical terminal. 4,621,421, Cl. 29-874.000.
Olry, Pierre, to Societe Europeenne de Propulsion. Process and apparatus for manufacturing axi-symmetrical three-dimensional structures. 4,621,662, Cl. 138-129.000.
Olson, Robert H., to Mobil Oil Corporation. Fastening apparatus for twist ties. 4,621,732, Cl. 206-346.000.
Olympus Optical: *See*—
Hashimoto, Akihiko; Shirai, Hitoshi; and Shiratori, Kazutoshi, 4,621,906, Cl. 350-429.000.
Olympus Optical Co., Ltd.: *See*—
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,622,584, Cl. 358-98.000.
Nakamura, Yuzo; Yamamoto, Soji; Sakai, Mitsugu; and Uchino, Fumio, 4,621,531, Cl. 73-606.000.
Omagari, Yasuhiko, 4,621,618, Cl. 128-6.000.
Takahashi, Susumu, 4,621,910, Cl. 350-469.000.
Omagari, Yasuhiko, to Olympus Optical Company, Ltd. Dual viewing and control apparatus for endoscope. 4,621,618, Cl. 128-6.000.
Omichi, Kaoru: *See*—
Ikenaka, Tokuji; and Omichi, Kaoru, 4,622,295, Cl. 435-22.000.
Omori, Hiroshi: *See*—
Kawabata, Susumu; Niimi, Hiroshi; Anahara, Meiji; and Omori, Hiroshi, 4,621,490, Cl. 57-328.000.
O'Neil, Elbridge A.: *See*—
Verbicky, John W., Jr.; and O'Neil, Elbridge A., 4,622,368, Cl. 525-426.000.
O'Neill, James A. Photochemical process using a waveguide reaction cell. 4,622,115, Cl. 204-157.410.
Onishi, Yasushi: *See*—
Kishi, Hajimu; Seki, Masaki; Takegahara, Takashi; and Onishi, Yasushi, 4,621,959, Cl. 409-84.000.
Ono, Kenji: *See*—
Watanabe, Hiroyuki; Hamada, Eiichi; Hayashi, Motomu; and Ono, Kenji, 4,621,453, Cl. 49-374.000.
Ono Pharmaceutical Co. Ltd.: *See*—
Hamanaka, Nobuyuki; Takada, Hideo; and Arai, Yoshinobu, 4,622,410, Cl. 549-304.000.
Ono, Tuyoshi: *See*—
Oishi, Kengo; and Ono, Tuyoshi, 4,622,618, Cl. 360-133.000.
Onodera, Takayoshi; and Kagata, Toru, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Wheel hub clutch assembly. 4,621,717, Cl. 192-36.000.
Onoma, Katsuyuki: *See*—
Motoki, Ryozo; Motoishi, Shoji; Izumo, Mishiroku; Onoma, Katsuyuki; and Sato, Toshikazu, 4,622,176, Cl. 252-631.000.
Onspot AB: *See*—
Hardmark, Ragnar, 4,621,712, Cl. 188-4.00B.
Opitz, Reinhard; and Breuer, Manfred, to Gerhard Collardin GmbH. Process for the zinc/calcium phosphatizing of metal surfaces at low treatment temperatures. 4,622,078, Cl. 148-6.15Z.
Optical Storage International Holland: *See*—
Hoogeveen, Leonardus P. J.; Peeters, Hendrikus W. C. M.; and Spruijt, Aloysius M. J. M., 4,622,661, Cl. 369-280.000.
Orchard, Lewis P.; and Simon, Judi K., to Kimberly-Clark Corporation. Visco-elastic weight. 4,621,808, Cl. 272-119.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., to Armour Pharmaceutical Company. [1,7-di-alanine]calcitonin. 4,622,386, Cl. 530-307.000.
Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Co. 8-methionine calcitonin. 4,622,387, Cl. 530-307.000.
Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Company. Des-2-serine, 3 asparagine-calcitonin. 4,622,388, Cl. 530-307.000.
Ormat Turbines Ltd.: *See*—
Bronicki, Lucien Y., 4,622,472, Cl. 290-52.000.
Ortel, Stanley G., to Better Wire Products, Inc. Tray stacking wire. 4,621,765, Cl. 229-52.0AW.
Orth, Dieter: *See*—
Simon, Bernd; Dammann, Hanns-Gerd; Muller, Peter; Legeler, Hans-Jurgen; Orth, Dieter; and Radunz, Hans-Eckart, 4,622,316, Cl. 514-162.000.
Orthofix S.r.l.: *See*—
DeBastiani, Giovanni; Faccioli, Giovanni; Aldegheri, Roberto; and Brivio, Lodovico R., 4,621,627, Cl. 128-92.0ZZ.
Ortolivo, Thomas V. Waterproof scouring glove with flange. 4,621,388, Cl. 15-227.000.
ORTOPEDIA GmbH: *See*—
Brudermann, Uwe, 4,621,628, Cl. 128-92.0VD.
Osafune, Haruo: *See*—
Matsuo, Nobutaka; Itoh, Yoshitaka; Kanbe, Sadao; Osafune, Haruo; and Motoki, Masanobu, 4,622,056, Cl. 65-18.100.
Osaka Gas Company, Limited: *See*—
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Pearl, William A. Bench construction for use in weight lifting. 4,621,809, Cl. 272-123.000.
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Radtke, Werner A.; and Roe, Joseph L., to Plastic Specialties and Technologies, Inc. Valve mounting assembly for aerosol containers and the like. 4,621,964, Cl. 413-9.000.
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Raudys, Vytas A., to Viskase Corporation. Stuffing apparatus and method. 4,621,392, Cl. 17-49.000.
Rayboy, Eric R. Liner for orthopedic cast. 4,621,624, Cl. 128-83.000.
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Bell, Isaac M., 4,622,589, Cl. 358-183.000.
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Levine, Peter A., 4,622,580, Cl. 358-50.000.
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Nichols, David B., Jr., 4,622,041, Cl. 8-478.000.
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Re, Ronald, to Tran-Saver, Inc. Adjustable fully automatic vacuum modulator control for automatic transmission having a vacuum modulator. 4,621,544, Cl. 74-863.000.
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Reddy, Malireddy S., to Mid-America Dairymen, Inc. Method of growing cheese starter microorganisms. 4,622,304, Cl. 435-253.000.
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Reimer, William A., to GTE Communication Systems Corp. Equipment drawer support. 4,621,876, Cl. 312-250.000.
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Reiser, Wolf; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Reinecke, Paul, 4,622,334, Cl. 514-383.000.
Reinwall, Ernest W., to Elco Industries, Inc. Fastener for roof assemblies and the like. 4,621,963, Cl. 411-369.000.
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Reiser, Wolf; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Reinecke, Paul, to Bayer Aktiengesellschaft. Combating fungi with 3-cycloalkyl-1-(1,3-dioxan-5-yl)2-(1,2,4-triazol-1-yl)-propan-1-ones and propan-1-ols. 4,622,334, Cl. 514-383.000.
Reitmeier, Glenn A.; and Carlson, Curtis R., to RCA Corporation. Decoder for extracting a 4:3 aspect ratio signal from a high definition television signal. 4,622,577, Cl. 358-11.000.
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Rembaum, Alan, to California Institute of Technology. Polyacrolein microspheres. 4,622,362, Cl. 525-54.100.
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Resing, Thomas A.; and Ely, George L., to Littleford Bros., Inc. Combined mixing, reacting, drying and filtering device. 4,622,152, Cl. 210-769.000.
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Rhodes, James A. Fishing apparatus with illuminated bait. 4,621,447, Cl. 43-17.500.
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Ridings, Jody W., to Plastic Oddities, Inc. Belt supported tool carrier. 4,621,753, Cl. 224-253.000.
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Riecke, Kurt, to Feldmuhle Aktiengesellschaft. Microcapsules having capsule walls formed of aliphatic diisocyanate and diamine. 4,622,267, Cl. 428-402.210.
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Rienacker, Klaus. Baggage set. 4,621,716, Cl. 190-108.000.
Riggle, Charles M.: *See—*
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Robertson, Robert; and Stuart, Donald C., to Atomic Energy of Canada Ltd. Gas-target method for the production of iodine-123. 4,622,201, Cl. 376-192.000.
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Roche, Joseph R., to Hydril Company. Marine riser fill-up valve. 4,621,655, Cl. 137-81.200.
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Roethel, Henry G., to Meyer Company, The. Dispenser valve. 4,621,750, Cl. 222-505.000.
Rogers, Albert J.; Smith, Michael E.; and Trounson, James E., to Cemtronics. Process for forming concrete machine tools. 4,622,194, Cl. 264-162.000.
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Rohm, Gunter H. Weapon with locking trigger. 4,621,445, Cl. 42-66.000.
Rohm, Gunter H. Hammer drill spindle and chuck assembly. 4,621,818, Cl. 279-1.0ME.
Rohm, Gunter H. Nonloosening hammer-drill chuck. 4,621,819, Cl. 279-1.00K.
Rohm, Gunter H. Percussion drilling apparatus. 4,621,820, Cl. 279-1.00B.
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Rosenquist, Niles R., to General Electric Company. Polyestercarbonate from amide substituted aromatic dicarboxylic acid. 4,622,379, Cl. 528-176.000.
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Roth, Paul, to MOTAN Gesellschaft mit beschrankter Haftung. Apparatus for dispensing active materials. 4,622,003, Cl. 431-1.000.
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Rowe, Charles E. D.; and Hinch, George R., to Murex Limited. Sintered molybdenum alloy process. 4,622,068, Cl. 75-245.000.
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Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., 4,622,418, Cl. 560-117.000.
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Rozniecki, Edward J. Adjustment structure. 4,621,962, Cl. 411-368.000.
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Rush, Derek A., to Smiths Industries Public Limited Company. Electrical contact elements, connectors and assemblies. 4,621,880, Cl. 339-17.0LC.
Russell, James T.: *See—*
West, John L.; and Russell, James T., 4,622,284, Cl. 430-290.000.
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Rutter, Karl J., to ROSE Verpackungsmachinenfabrik theegarten GmbH & Co. KG. Apparatus for feeding articles to a packaging station. 4,621,725, Cl. 198-448.000.
Ruzo, Luis O.: *See—*
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Ryan, Douglas G.: *See—*
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St. Ledger, Lester A., to Roto Moulded Plastics Pty. Limited. Automatic water level monitoring system. 4,621,657, Cl. 137-426.000.
Saito, Junichi; Kurahashi, Yoshio; Goto, Toshio; and Yamaguchi, Naoko, to Nihon Tokushu Noyaku Seizo K. K. Triazolo-(3,2-c)perhydroxazin-8-one derivatives and use as fungicides and plant growth regulators. 4,622,064, Cl. 71-92.000.
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Sakurai, Seiji; and Umino, Kaoru, to Nichias Corporation. Fibrous composite material for fused aluminum. 4,622,070, Cl. 106-38.220.
Salani, C. Ranjan, to Koehring Company. Quickly replaceable cutter socket. 4,621,871, Cl. 299-91.000.
Salansky, Werner, to Stabeg Apparatebaugesellschaft m.b.h. Installation for the transport of tennis balls. 4,621,812, Cl. 273-29.00A.
Saleeb, Fouad Z.; and McKay, Randal P., to General Foods Corporation. Acidulent comprising fumaric acid and dried natural juice solids. 4,622,227, Cl. 426-96.000.
Salem, Eli; Muller, Raymond J.; and Stracey, Stanley T., to Graver Company, The. Method and apparatus for withdrawing a layer of material from a vessel. 4,622,141, Cl. 210-189.000.
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Coon, Dennis C.; Narusewicz, Michael A.; and Sanders, Ward L., 4,621,735, Cl. 206-438.000.
Sanderson, Albert M.; Pearson, Arthur; and Bates, David A., to George Salter & Co. Ltd. Method and apparatus for making circlips. 4,621,515, Cl. 72-403.000.
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Frauenknecht, Josef; and Zeller, Karl, 4,622,045, Cl. 8-531.000.
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Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,621,823, Cl. 280-91.000.
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Suzuki, Tomonori, 4,621,595, Cl. 123-41.720.
Santini, Georges: *See—*
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Santrade Limited: *See—*
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Sanyo-Kokusaku Pulp Co., Ltd.: *See—*
Kasamatsu, Norikazu; Matsukawa, Masao; Hirata, Hirokazu; and Mishima, Masaru, 4,622,566, Cl. 346-214.000.
Sarre, Olga: *See—*
Ganguly, Ashit K.; Sarre, Olga; and Girijavallabhan, Viyyoor M., 4,622,314, Cl. 514-54.000.
Sasaki, Keiji: *See—*
Tsuruoka, Mitsuharu; and Sasaki, Keiji, 4,622,605, Cl. 360-94.000.
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Sasaki, Yoshio: *See—*
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Sasaoka, Michio: *See—*
Torii, Shigeru; Tanaka, Hideo; Nogami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,622,178, Cl. 540-358.000.
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Takagi, Atsushi; Izumi, Shigeru; Takahashi, Fuminobu; Sato, Chikara; Naitoh, Shinji; and Sonoda, Shinji, 4,621,532, Cl. 73-623.000.
Sato, Hideo: *See—*
Kondo, Syunichi; Horie, Seiji; Sato, Hideo; and Sano, Kenji, 4,622,278, Cl. 430-59.000.
Makino, Naonori; Kawamura, Kouichi; Horie, Seiji; and Sato, Hideo, 4,622,280, Cl. 430-70.000.
Yuyama, Yasuaki; Kondo, Syunichi; and Sato, Hideo, 4,622,279, Cl. 430-66.000.
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Sato, Toshikazu: *See—*
Motoki, Ryozo; Motoishi, Shoji; Izumo, Mishiroku; Onoma, Katsuyuki; and Sato, Toshikazu, 4,622,176, Cl. 252-631.000.
Satoh, Takao; Murakami, Masaki; Kawasaki, Nobuhiro; Ichisaka, Teruo; and Katayama, Shinji, to Toyo Soda Manufacturing Co., Ltd.; and Chlorine Engineers Corp., Ltd. Process for producing caustic alkalis. 4,622,113, Cl. 204-98.000.
Sauvee, Jean P.: *See—*
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Saville, Marshall P.: *See—*
Gu, Alston L.; and Saville, Marshall P., 4,621,930, Cl. 384-105.000.
Savin Corporation: *See—*
Bastow, Francis M.; and Hoffman, William C., 4,621,799, Cl. 271-10.000.
Sawaya, Marty: *See—*
Hsia, Sung L.; Voigt, Walter; Sawaya, Marty; and Zeoli, Kathryn, 4,622,317, Cl. 514-178.000.
Sawtek, Inc.: *See—*
Brown, Roy B., 4,622,525, Cl. 333-151.000.
Sayen, Michael D. Plant watering/misting device. 4,621,770, Cl. 239-304.000.
Scaduto, Onofrio. Convertible top for automobiles. 4,621,861, Cl. 296-118.000.
Scarfe, Frederick, to Electroglass Limited. Electrically heated forehearth. 4,622,678, Cl. 373-134.000.
Scarinci, Thomas P.: *See—*
Snell, Stephen C.; and Scarinci, Thomas P., 4,622,681, Cl. 375-48.000.
Schadt, Martin: *See—*
Petrzilka, Martin; and Schadt, Martin, 4,621,901, Cl. 350-350.00R.
Schaefer, Ernst-Dieter, to ITT Industries, Inc. Tandem master cylinder. 4,621,498, Cl. 60-562.000.
Schaeffer, Wayne G.: *See—*
Ares, Roland A.; Cromer, James M.; Schaeffer, Wayne G.; and Wehmeier, William C., 4,621,505, Cl. 62-509.000.
Schafer, Charles J.: *See—*
Schafer, Christopher E.; Schafer, William P.; and Schafer, Charles J., 4,621,945, Cl. 405-39.000.
Schafer, Christopher E.; Schafer, William P.; and Schafer, Charles J. Head control stand. 4,621,945, Cl. 405-39.000.
Schafer, Thomas B.; Sindelar, William, deceased (by Sindelar, Dorothy, legal representative); and Cummens, Joseph R., to Avondale Industries, Inc. Transfer feed press with transfer feed system. 4,621,516, Cl. 72-405.000.
Schafer, William P.: *See—*
Schafer, Christopher E.; Schafer, William P.; and Schafer, Charles J., 4,621,945, Cl. 405-39.000.
Schemmann, Hugo; and Bukoschek, Romuald L., to U.S. Philips Corporation. Shear head of a dry-shaver comprising a shear foil which is clamped so as to be curved. 4,621,423, Cl. 30-43.920.

Scherbing, Frank J., to Fort Lock Corporation. Axial pin tubular lock with improved punch-out security. 4,621,510, Cl. 70-363.000.

Schering Corporation: *See*—
Ganguly, Ashit K.; Sarre, Olga; and Girijavallabhan, Viyyoor M., 4,622,314, Cl. 514-54.000.

Scheuchzer, Fredy; and Buehler, Fritz, to Les Fils d'Auguste Scheuchzer S.A. Machine for reshaping rail heads. 4,621,460, Cl. 51-178.000.

Schiehser, Guy A.; and Strike, Donald P., to American Home Products Corporation. Process for preparing thieno-fused heterocyclic anti-ulcer agents and intermediates therefor. 4,622,402, Cl. 548-212.000.

Schienda, Gregory A.: *See*—
Kupersmith, Bertram F.; Shull, Julian H.; Full, Gary G.; and Schienda, Gregory A., 4,622,551, Cl. 340-825.060.

Schilling, Donald P.; Jodoin, Raymond C.; and Johnston, Joseph E., to Rogers Corporation. Decoupling capacitor and method of manufacture thereof. 4,622,619, Cl. 361-306.000.

Schindler, Joachim: *See*—
Schmid, Karl; Schindler, Joachim; and Asbeck, Adolf, 4,622,303, Cl. 435-243.000.

Schleppnik, Alfred A., to Bush Boake Allen Inc. Method, compositions and compounds, useful in room fresheners employing cyclohexyl alcohol and ester derivatives. 4,622,221, Cl. 424-76.000.

Schlicht, Heribert: *See*—
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; Schlicht, Heribert; and Schroer, Franz-Josef, 4,621,440, Cl. 34-155.000.

Schmaling, David N.: *See*—
Reavely, Richard T.; and Schmaling, David N., 4,621,980, Cl. 416-226.000.

Schmid, Karl; Schindler, Joachim; and Asbeck, Adolf, to Henkel Kommanditgesellschaft auf Aktien. Defoamers for yeast fermentation. 4,622,303, Cl. 435-243.000.

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Abthoff, Jorg; Schuster, Hans-Dieter; and Schmidt, Karlwalter, 4,621,604, Cl. 123-446.000.

Schmidt, Robert R.: *See*—
Forster, Heinz; Gallenkamp, Bernd; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,622,415, Cl. 560-62.000.

Schneider, Lon M.; and Walters, William R., to Corcom, Inc. Power line interference filter mounted on a PC board. 4,622,526, Cl. 333-181.000.

Schneider, Rudolf, to Erowa AG. Apparatus for the clamping of elongate workpieces. 4,621,821, Cl. 279-83.000.

Schneider, Rudolf: *See*—
Bauer, Walter; Farber, Heinrich; and Schneider, Rudolf, 4,621,800, Cl. 271-11.000.

Schneider, Walter, to W. Schneider & Co. AG Metallwarenfabrik. Box-like furniture structure. 4,621,879, Cl. 312-258.000.

Schnur, Rodney C., to Pfizer Inc. Hypoglycemic 5-substituted oxazolidine-2,4-diones. 4,622,406, Cl. 549-4.000.

Schoenthaler, David; and Wojcik, Thaddeus, to AT&T Technologies, Inc. Method and apparatus for dispensing viscous materials. 4,622,239, Cl. 427-96.000.

Scholman, William W., Jr.; and Davis, James A., to Firestone Tire & Rubber Company, The. Polyether treated guayule resin and rubber compositions containing the same. 4,622,365, Cl. 525-332.500.

Schoolnik, Gary K.; and Rothbard, Jonathan, to Board of Trustees for the Leland Stanford University, The. Broad spectrum vaccine against gonorrhea. 4,622,223, Cl. 424-92.000.

Schramek, Joseph L. Knockdown sofa. 4,621,381, Cl. 5-51.00B.

Schreiber, Georg, to VLT Gesellschaft fur Verfahrenstechnische Entwicklung mbH. Treatment system and method for fluids containing particulate matter. 4,621,928, Cl. 366-137.000.

Schreiber, William L.; Gillaspey, William D.; Fujioka, Futoshi; and Hanna, Marie R., to International Flavors & Fragrances Inc. Alkyl-substituted spiroundecenone derivatives, organoleptic utility thereof and processes for preparing same. 4,622,172, Cl. 252-522.00R.

Schreiber, William L.: *See*—
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., 4,622,171, Cl. 252-522.00R.

Schrenk, Hannes. Method of and apparatus for producing expanded metal. 4,621,397, Cl. 29-6.100.

Schroeder, Warren C. Ocean wave hydro-electric generator facility. 4,622,471, Cl. 290-42.000.

Schroer, Franz-Josef: *See*—
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; Schlicht, Heribert; and Schroer, Franz-Josef, 4,621,440, Cl. 34-155.000.

Schuh, Frank J., to Atlantic Richfield Company. Well drilling. 4,621,691, Cl. 166-268.000.

Schulte, Thomas H.: *See*—
Mansour, James D.; Schulte, Thomas H.; and Sage, Burton H., 4,622,298, Cl. 435-34.000.

Schultz, William J., to Masonite Corporation. Method of making wet process panels of composite wood material with semi-matching contoured pressure plates. 4,622,190, Cl. 264-119.000.

Schultz, William R., Jr.: *See*—
Elton, Richard K.; and Schultz, William R., Jr., 4,622,116, Cl. 204-181.100.

Schulz, Manfred: *See*—
Knochelmann, Fred; Schulz, Manfred; and Ast, Gunther, 4,621,822, Cl. 280-5.00A.

Schulz, Peter; Klein, Jurgen; and Vaupel, Knut, to Bergwerksverband GmbH. Method of and apparatus for the thermal regeneration of adsorbents. 4,622,008, Cl. 432-95.000.

Schulz, Rene ; Braum, Heinrich J.; Nadolny, Kurt; and Nguyen, Van-Trung, to Vickers System GmbH; and Daimler-Benz Aktiegesellschaft. Double pump. 4,621,982, Cl. 417-201.000.

Schulze, Gunter: *See*—
Dohmann, Fritz; Franz, Peter; Klaas, Friedrich; and Schulze, Gunter, 4,621,514, Cl. 72-354.000.

Schundehutte, Karl H.: *See*—
Lorenz, Manfred; and Schundehutte, Karl H., 4,622,391, Cl. 534-707.000.

Schuster, Hans-Dieter: *See*—
Abthoff, Jorg; Schuster, Hans-Dieter; and Schmidt, Karlwalter, 4,621,604, Cl. 123-446.000.

Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., to Eaton Corporation. Planar field-shaped bidirectional power FET. 4,622,568, Cl. 357-23.400.

Schutten, Herman P.: *See*—
Lade, Robert W.; Benjamin, James A.; and Schutten, Herman P., 4,622,569, Cl. 357-23.400.

Schwarz, Albert J.: *See*—
Kowal, Leonard J.; Schwarz, Albert J.; and Wells, Norman B., 4,621,842, Cl. 285-322.000.

Schwarz, Alfred C.: *See*—
Bickes, Robert W., Jr.; Kopczewski, Michael R.; and Schwarz, Alfred C., 4,621,577, Cl. 102-200.000.

Schwarz, Frederick M.; and Stoner, Barry L., to United Technologies Corporation. Leakage detection and tracking system. 4,621,520, Cl. 73-40.000.

Schwarz, Richard A.: *See*—
Misura, Michael S.; Schwarz, Richard A.; and Oates, Stephanie J., 4,622,376, Cl. 526-286.000.

Schwarzkopf, Eugen, to Hotset Heizpatronen und Zubehor GmbH. Connection assembly for electric cartridge heater. 4,622,455, Cl. 219-541.000.

Schweder, Roland: *See*—
Pennewiss, Horst; Schweder, Roland; and Knoell, Helmut, 4,622,358, Cl. 524-297.000.

Searl, Alonzo H.: *See*—
Hahn, Granville J.; Rutledge, Raleigh N.; Searl, Alonzo H.; and Sommerman, Walter E., 4,621,678, Cl. 165-27.000.

Searle, Gregory C. L.: *See*—
Waller, John C.; and Searle, Gregory C. L., 4,622,646, Cl. 364-571.000.

Seetru Limited: *See*—
Varga, Otto H.; and Robbins, Montague A., 4,621,527, Cl. 73-329.000.

Seiko Epson Corporation: *See*—
Kiyonaga, Bunzo, 4,621,900, Cl. 350-350.00R.
Matsuo, Nobutaka; Itoh, Yoshitaka; Kanbe, Sadao; Osafune, Haruo; and Motoki, Masanobu, 4,622,056, Cl. 65-18.100.

Seiko Instruments & Electronics Ltd.: *See*—
Kamiya, Masaaki; and Kojima, Yoshikazu, 4,622,656, Cl. 365-185.000.

Seita, Toru: *See*—
Watanabe, Hiroyuki; and Seita, Toru, 4,622,112, Cl. 204-81.000.

Seki, Masaki: *See*—
Kishi, Hajimu; Seki, Masaki; Takegahara, Takashi; and Onishi, Yasushi, 4,621,959, Cl. 409-84.000.

Sekida, Minoru: *See*—
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,621,914, Cl. 354-21.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,622,432, Cl. 136-246.000.

Senft, Ernst; Hirth, Hans; and Klemmer, Herbert, to Daimler-Benz Aktiengesellschaft. Foot-operated parking brake. 4,621,538, Cl. 74-512.000.

Sennett, Colin: *See*—
Carr, Michael J. R.; Sennett, Colin; Wilkinson, Brian; and Winn, Russell E., deceased, 4,621,562, Cl. 89-41.050.

Sequoia-Turner Corporation: *See*—
Stefanski, Andrew; Sturtevant, Alfred H.; Konicek, Michael G.; and Lobban, Peter E., 4,622,468, Cl. 250-458.100.

Seuter, Friedel: *See*—
Lieb, Folker; Oediger, Hermann; Kabbe, Hans-Joachim; Niewohner, Ulrich; Perzborn, Elisabeth; and Seuter, Friedel, 4,622,339, Cl. 514-563.000.

Seyler, Jay K.: *See*—
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,622,386, Cl. 530-307.000.
Orlowski, Ronald C.; and Seyler, Jay K., 4,622,387, Cl. 530-307.000.
Orlowski, Ronald C.; and Seyler, Jay K., 4,622,388, Cl. 530-307.000.

Sfarti, Adrian; and Dines, Steven, to Advanced Micro Devices, Inc. Apparatus and method for displaying characters in a bit mapped graphics system. 4,622,546, Cl. 340-748.000.

Shabel, Barrie S.; and Young, Robert F., to Aluminum Company of America. Rapid determination of metal strength from hardness tests. 4,621,523, Cl. 73-81.000.

Shafai, Lotfollah; Kishk, Ahmed A. A.; Bridges, Ernest; and Ittipiboon, Apisak, to Canadian Patents & Development Limited. Paraboloid reflector antenna feed having a flange with tapered corrugations. 4,622,559, Cl. 343-786.000.

Sharma, Devendra N. Electro-magnetically controlled artificial heart device for compressing cardiac muscle. 4,621,617, Cl. 128-1.00D.
Sharp Kabushiki Kaisha: *See*—
Ise, Hasahiro; Tanaka, Hidehiko; Machino, Katsuyuki; Matsubara, Toshiyuki; and Terasaka, Teiji, 4,622,535, Cl. 340-310.00R.
Ise, Masahiro; Tanaka, Hidehiko; Machino, Katsuyuki; Matsubara, Toshiyuki; and Terasaka, Teiji, 4,622,478, Cl. 307-354.000.
Kimura, Naofumi; Makagawa, Kenichi; Ishii, Yutaka; and Funada, Fumiaki, 4,622,162, Cl. 252-299.500.
Mohri, Motoo; and Tajima, Yoshimitsu, 4,621,417, Cl. 29-623.100.
Sharp, Keith W.: *See*—
Watson, Kenneth E.; and Sharp, Keith W., 4,622,153, Cl. 252-8.514.
Sharpe, David T., to Plastech Research & Design Limited. Retractor having means for attachment to patient's skin. 4,621,619, Cl. 128-20.000.
Shattuck, Bruce T., to Kinetic Concepts, Inc. Medical tube holder. 4,622,034, Cl. 604-179.000.
Shaw, Wilfrid G.: *See*—
Callahan, James L.; Miller, Arthur F.; and Shaw, Wilfrid G., 4,622,424, Cl. 562-545.000.
Shaylor-Billings, John D.: *See*—
Eaton, Homer L.; and Shaylor-Billings, John D., 4,622,462, Cl. 250-236.000.
Sheehan, John C.; and Lo, Young S., to Massachusetts Institute of Technology. Oxygen analogs of cephalosporins. 4,622,394, Cl. 540-228.000.
Sheets, Thomas M., to Du Pont de Nemours, E. I., and Company. Photoimaging composition containing admixture of leuco dye and 2,4,5-triphenylimidazolyl dimer. 4,622,286, Cl. 430-343.000.
Shekerjian, Hart, to Motorola Inc. Semiconductor device package and method thereof. 4,622,434, Cl. 174-52.00H.
Sheldon, Donald A.; and Tews, Richard R., to Kimberly-Clark Corporation. Reverse folded convolutely wound tampon tube. 4,622,030, Cl. 604-15.000.
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Bayle, Gerhard G.; Bijwaard, Henricus M. J.; and Janssen, Martinus M. P., 4,622,129, Cl. 208-87.000.
Bradford, John F., Jr., 4,621,513, Cl. 72-334.000.
Djiauw, Lie K.; and Icenogle, Ronald D., 4,622,352, Cl. 523-200.000.
Icenogle, Ronald D.; and Djiauw, Lie K., 4,622,350, Cl. 523-200.000.
Kipp, Robert M.; and Ayers, Ray R., 4,621,844, Cl. 285-381.000.
Marshall, Peter W.; and Johnson, Paul R., 4,621,949, Cl. 405-202.000.
Stem, Stephen C., 4,622,130, Cl. 208-87.000.
Wong, Pui K., 4,622,375, Cl. 526-284.000.
Sheller, Samuel L.: *See*—
Andrews, Grealie A.; and Sheller, Samuel L., 4,622,552, Cl. 342-196.000.
Shemanske, Richard; and Min, Young-Kee, to PT Components. Load and speed sensitive motor starting circuit. 4,622,506, Cl. 318-786.000.
Sherex Chemical Company, Inc.: *See*—
Whittlinger, David E., 4,622,168, Cl. 252-352.000.
Sherman, David G.: *See*—
Meares, Claude F.; Yeh, Simon M.; and Sherman, David G., 4,622,420, Cl. 562-443.000.
Shiga, Norio: *See*—
Okabayashi, Mitumasa; and Shiga, Norio, 4,622,505, Cl. 318-696.000.
Shih, Cheng-Chung; and Gray, Paul R., to University of California, Regents of the. Ratio independent cyclic A/D and D/A conversion using a reciprocating reference approach. 4,622,536, Cl. 340-347.0DA.
Shih, Hung-Dah, to Texas Instruments Incorporated. Molecular beam epitaxial process. 4,622,083, Cl. 148-175.000.
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Tsukagoshi, Minoru; Nakayama, Takuo; Minagawa, Masahiko; and Yoshida, Shuji, 4,622,097, Cl. 156-644.000.
Shimada, Satoru: *See*—
Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,621,702, Cl. 180-140.000.
Shimada, Shusaku: *See*—
Awata, Hidenori; Shimada, Shusaku; Kikuchi, Morio; and Abe, Kenichi, 4,622,448, Cl. 219-10.55A.
Shimakura, Yoshiteru: *See*—
Shimizu, Toshihide; Kaneko, Ichiro; and Shimakura, Yoshiteru, 4,622,245, Cl. 427-230.000.
Shimamura, Yukio; Tsukuda, Yoshihiro; and Maeda, Ikuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Power load survey apparatus. 4,622,640, Cl. 364-483.000.
Shimizu, Takafumi; and Tomizawa, Ichiro, to Fujitsu Limited. Subscriber line radio concentration system with automatic response for a loop back test. 4,622,438, Cl. 379-63.000.
Shimizu, Toshihide; Kaneko, Ichiro; and Shimakura, Yoshiteru, to Shin-Etsu Chemical Co., Ltd. Method for preventing polymer scale deposition in the polymerization of an ethylenically unsaturated monomer. 4,622,245, Cl. 427-230.000.
Shimizu, Yoshiki: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,622,364, Cl. 525-200.000.
Shimomura, Setsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Engine air/fuel ratio sensing device. 4,622,126, Cl. 204-425.000.
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Shimizu, Toshihide; Kaneko, Ichiro; and Shimakura, Yoshiteru, 4,622,245, Cl. 427-230.000.
Shin Nihon Tsusho Kabushiki Kaisha: *See*—
Yamada, Masaharu; and Konno, Iseo, 4,621,913, Cl. 353-39.000.
Shinozaki, Yasuhide: *See*—
Mori, Sadao; Yorozuya, Tsuruo; Wada, Yuichi; and Shinozaki, Yasuhide, 4,622,533, Cl. 337-114.000.
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Arai, Yoshihiro; and Shirahata, Ryuji, 4,622,271, Cl. 428-615.000.
Shirai, Hitoshi: *See*—
Hashimoto, Akihiko; Shirai, Hitoshi; and Shiratori, Kazutoshi, 4,621,906, Cl. 350-429.000.
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Hashimoto, Akihiko; Shirai, Hitoshi; and Shiratori, Kazutoshi, 4,621,906, Cl. 350-429.000.
Shirley-Elgood, John R. R.; Roulstone, Geoffrey A.; and Thakkar, Mahendra R., to Fisons plc. Water still with a cyclone liquid-vapor separator. 4,622,103, Cl. 202-185.00E.
Shiroi, Takashi: *See*—
Torii, Shigeru; Tanaka, Hideo; Nogami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,622,178, Cl. 540-358.000.
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Shop-Vac Corporation: *See*—
Berfield, Robert C., 4,621,849, Cl. 29.s-155.000.
Shore Plastics Inc.: *See*—
Sussman, Morris, 4,621,935, Cl. 401-82.000.
Shoup, Robert D.: *See*—
Chyung, Kenneth; Dwyer, Thomas J.; Foster, Gordon F.; Shoup, Robert D.; and Young, Roger A., 4,622,057, Cl. 65-18.100.
Shull, Julian H.: *See*—
Kupersmith, Bertram F.; Shull, Julian H.; Full, Gary G.; and Schienda, Gregory A., 4,622,551, Cl. 340-825.060.
Shutske, Gregory M., to Hoechst-Roussel Pharmaceuticals Inc. 6H-isoxazolo(5,4-d)pyrazolo(3,4-b)pyridines, and their use as antihypertensive and analgesic agents. 4,622,326, Cl. 514-293.000.
Sibalis, Dan, to Drug Delivery Systems Inc. Indicator for electrophoretic transcutaneous drug delivery device. 4,622,031, Cl. 604-20.000.
Siemens Aktiengesellschaft: *See*—
Ahne, Hellmut, 4,622,285, Cl. 430-322.000.
Mathyssek, Konrad; and Smola, Jan, 4,622,055, Cl. 65-2.000.
Michel, Hartmut, 4,622,620, Cl. 361-323.000.
Starck, Alexander, 4,622,579, Cl. 358-13.000.
Wengert, Rolf; and Cicchi, Pietro, 4,622,272, Cl. 428-690.000.
Siemens Energy & Automation, Inc.: *See*—
Stich, Frederick A., 4,622,513, Cl. 323-343.000.
Silverman, Martin L., to Warner & Swasey Company, The. Tailstock quill hydraulic circuit. 4,621,551, Cl. 82-31.000.
Silvestrini, Thomas A., to Pfizer Hospital Products Group, Inc. Hard elastic sutures. 4,621,638, Cl. 128-335.500.
Simier, Jean-Noel: *See*—
Nardi, Alain; and Simier, Jean-Noel, 4,622,209, Cl. 422-112.000.
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Simon, Helmut: *See*—
Gunther, Helmut; Neumann, Stefan; and Simon, Helmut, 4,622,301, Cl. 435-146.000.
Simon, Judi K.: *See*—
Orchard, Lewis P.; and Simon, Judi K., 4,621,808, Cl. 272-119.000.
Simplicity Manufacturing, Inc.: *See*—
Slazas, John J., 4,621,699, Cl. 180-53.700.
Sindelar, Dorothy, legal representative: *See*—
Schafer, Thomas B.; Sindelar, William, deceased; and Cummens, Joseph R., 4,621,516, Cl. 72-405.000.
Sindelar, William, deceased: *See*—
Schafer, Thomas B.; Sindelar, William, deceased; and Cummens, Joseph R., 4,621,516, Cl. 72-405.000.
Singer Company, The: *See*—
Pittman, Roland, 4,621,529, Cl. 73-504.000.
Sirinyan, Kirkor; Giesecke, Henning; Wolf, Gerhard D.; Ebneth, Harold; and Merten, Rudolf, to Bayer Aktiengesellschaft. Organopalladium-II-complex compounds. 4,622,411, Cl. 556-136.000.
SKF GmbH, Schweinfurt: *See*—
Kufner, Walter; and Winter, Heinrich, 4,621,932, Cl. 384-569.000.
SKF Industrial Trading and Development Company B.V.: *See*—
Merkelbach, Boy, 4,621,700, Cl. 180-70.100.
SKF Kugellagerfabriken GmbH: *See*—
Gossmann, Willi; Pape, Gebhard; Klupfel, Norbert; and Stark, Josef, 4,621,402, Cl. 29-407.000.
Skurka, James A., to Sloan Valve Company. Vehicle slack adjuster clutch. 4,621,714, Cl. 188-196.0BA.
Slaats, Mathew A.; and Strange, Patrick E., to Kimball International, Inc. Height control mechanism. 4,621,868, Cl. 297-347.000.
Slavicek, Donald, to Molex Incorporated. Apparatus for making a tape carrier. 4,621,486, Cl. 53-580.000.
Slavin, Martin J., to In Tech Systems Corp. Differential hearing aid with programmable frequency response. 4,622,440, Cl. 381-68.100.
Slazas, John J., to Simplicity Manufacturing, Inc. Power takeoff for tractor having parallelogram front wheel suspension. 4,621,699, Cl. 180-53.700.
Sloan Valve Company: *See*—
Skurka, James A., 4,621,714, Cl. 188-196.0BA.

Smeelen, Theodorus J. H., to U.S. Philips Corporation. Electrodeless discharge lamp with rapid light build-up. 4,622,495, Cl. 315-248.000.
Smith Engineering: *See—*
Smith, Jay, III; and Karr, Gerald S., 4,622,690, Cl. 381-31.000.
Smith, Francis E.; Hyatt, Robert L.; and Kline, Leonard J., Jr., to Ametek, Inc. Quiet by-pass vacuum motor. 4,621,991, Cl. 417-423.00A.
Smith, Jay, III; and Karr, Gerald S., to Smith Engineering. Audio frequency multiplication device. 4,622,690, Cl. 381-31.000.
Smith, John C., Jr.: *See—*
Williamson, David T. N., 4,621,410, Cl. 29-568.000.
Smith, Kobert R., II. Information storage and retrieval system including an information containing cartridge having a slidable cover. 4,622,607, Cl. 360-97.000.
Smith, Michael E.: *See—*
Rogers, Albert J.; Smith, Michael E.; and Trounson, James E., 4,622,194, Cl. 264-162.000.
Smith, Robert S. Flat disk polishing apparatus. 4,621,458, Cl. 51-111.00R.
Smithers Medical Products, Inc.: *See—*
Kostich, Jeffrey V., 4,622,185, Cl. 264-45.200.
Smiths Industries Public Limited Company: *See—*
Rush, Derek A., 4,621,880, Cl. 339-17.0LC.
Smola, Jan: *See—*
Mathyssek, Konrad; and Smola, Jan, 4,622,055, Cl. 65-2.000.
Smoler, Lewis S. Dental post system. 4,622,012, Cl. 433-221.000.
Snell, Stephen C.; and Scarinci, Thomas P., to Empath Communications, Inc. Apparatus for transmitting digital data. 4,622,681, Cl. 375-48.000.
Snia Fibre S.p.A.: *See—*
Paravella, Luciano; and Figini, Luigi, 4,621,778, Cl. 242-35.50A.
Snyckers, Friedrich O.: *See—*
Dekker, Theodor G.; Oliver, Douglas W.; Snyckers, Friedrich O.; and van der Schyf, Cornelis J., 4,622,430, Cl. 564-458.000.
Soborowski, Michael J.: *See—*
Dyett, Derek H.; and Soborowski, Michael J., 4,621,650, Cl. 131-282.000.
Societe Anonyme D.B.A.: *See—*
Carre, Jean J.; Pressaco, Pierre; and Sauvee, Jean P., 4,621,713, Cl. 188-72.700.
Societe Anonyme de Telecommunications: *See—*
Guichard, Jean-Louis V., 4,622,684, Cl. 375-116.000.
Societe Chimique des Charbonnages-CdF Chimie: *See—*
Nardi, Alain; and Simier, Jean-Noel, 4,622,209, Cl. 422-112.000.
Societe Europeenne de Propulsion: *See—*
Olry, Pierre, 4,621,662, Cl. 138-129.000.
Societe Nationale des Poudres et Explosifs: *See—*
Vallieres, Yves; and Granier, Georges, 4,621,578, Cl. 102-202.900.
Societe Nationale Industrielle Aerospatiale: *See—*
Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, 4,621,834, Cl. 280-715.000.
Doyhamboure, Francois; and Morand, Jean, 4,621,780, Cl. 244-118.200.
Societe Nationale Industrielle et Aerospatiale: *See—*
Arnaud, Jean-Louis; and Floret, Michel, 4,622,517, Cl. 324-262.000.
Sohar, Pal: *See—*
Bernath, Gabor; Kobor, Jeno; Kalman, Alajos; Sohar, Pal; Fulop, Ferenc; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , 4,622,327, Cl. 514-294.000.
Sokkisha Co., Ltd.: *See—*
Kurimoto, Masahiro, 4,621,436, Cl. 33-561.000.
Solheim, Karsten. Golf club set. 4,621,813, Cl. 273-77.00A.
Solomon, Fred D.: *See—*
Byers, Hugo A.; and Solomon, Fred D., 4,621,679, Cl. 165-39.000.
Soltis, Michael W., to Ford Motor Company. Control system for multistable suspension unit. 4,621,833, Cl. 280-707.000.
Soltysiak, John R.; and Harrod, Jimmie A., to Moore Business Forms, Inc. Relieved serrated dies for rotary punching units. 4,621,556, Cl. 83-670.000.
Sommerman, Walter E.: *See—*
Hahn, Granville J.; Rutledge, Raleigh N.; Searl, Alonzo H.; and Sommerman, Walter E., 4,621,678, Cl. 165-27.000.
Son, Tae Won: *See—*
Yoon, Han Sik; Son, Tae Won; Lee, Chul Joo; and Min, Byung Ghyl, 4,622,265, Cl. 428-364.000.
Sonneborn, Kurt J.: *See—*
Chang, Kern K. N.; Cooke, Anthony R.; and Sonneborn, Kurt J., 4,622,084, Cl. 156-89.000.
Sonneborn, Siegfried; Handel, Manfred; and Mack, Ernst, to Rasmussen Holding S/A. Flashing frame for the installation of adjacent roof windows. 4,621,466, Cl. 52-15.000.
Sonnenschein, Hans; and Paikert, Paul, to Ges Luftkuhlergesellschaft Happel GmbH & Co. Device for transferring cooling water of a wet or wet/dry cooling tower to recirculation means. 4,622,183, Cl. 261-110.000.
Sono, Nobuo: *See—*
Gomi, Tadashi; Sakata, Kenji; Aoyama, Ichiro; and Sono, Nobuo, 4,622,360, Cl. 524-507.000.
Sonoco Products Company: *See—*
Baxley, William H., Jr.; and Giles, Noah Y., Jr., 4,621,508, Cl. 68-198.000.
Sonoda, Shinji: *See—*
Takagi, Atsushi; Izumi, Shigeru; Takahashi, Fuminobu; Sato, Chikara; Naitoh, Shinji; and Sonoda, Shinji, 4,621,532, Cl. 73-623.000.
Sony Corporation: *See—*
Doi, Toshitada; Brandes, Claudia; and Lagadec, Roger, 4,622,598, Cl. 360-22.000.
Furukawa, Shunsuke; Hattori, Yoshitsugu; Matsumoto, Yoshihiko; and Okubo, Hiroshi, 4,622,547, Cl. 340-750.000.
Kihara, Taku; and Nakamura, Takashi, 4,622,581, Cl. 358-51.000.
Kobayashi, Kazuyoshi; and Harada, Yoshio, 4,621,412, Cl. 29-571.000.
Kutaragi, Ken, 4,622,602, Cl. 360-48.000.
Murano, Kanji; Nishigaki, Susumu; Himuro, Masami; and Watanabe, Yoshihisa, 4,621,903, Cl. 350-390.000.
Suzuki, Toshihiko; Isawa, Nobuyuki; Ohkubo, Yasunori; and Hoshi, Kinji, 4,622,211, Cl. 422-248.000.
Yamashita, Keitaro; and Tsuneki, Keizo, 4,622,614, Cl. 360-118.000.
Sowers, Arthur E., to American National Red Cross. Process for inducing membrane fusion under an electric field. 4,622,302, Cl. 435-172.200.
Spector, George: *See—*
Staskiewicz, Vincent P.; and Spector, George, 4,621,791, Cl. 254-17.000.
Spectra-Physics, Inc.: *See—*
Bradley, Martin P. T.; Miller, Lealie A.; McCall, Thomas J.; and Middlebusher, Duane L., 4,622,457, Cl. 235-464.000.
Speir, Donald J.: *See—*
Bryant, Stephen M.; and Speir, Donald J., 4,622,556, Cl. 342-174.000.
Sperry Corporation: *See—*
Yount, Larry J., 4,622,667, Cl. 371-9.000.
Spicher, Kenneth N. Weathershield for golf cart and a method of enclosing a golf cart. 4,621,859, Cl. 296-78.00R.
Spinelli, Harry J.: *See—*
Dicker, Ira B.; Hutchins, Clyde S.; and Spinelli, Harry J., 4,622,372, Cl. 526-190.000.
Spingath, Benjamin F., Jr., to Swaim, William, a part interest. Plunger apparatus. 4,621,987, Cl. 417-313.000.
Sprague Electric Company: *See—*
Puppolo, Henry F., 4,622,109, Cl. 204-38.300.
Sprague, Robert A.: *See—*
Chang, Winston H.; Sprague, Robert A.; and Stahl, Joseph A., 4,622,079, Cl. 148-11.50F.
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., to International Flavors & Fragrances Inc. Polyhydroindan carboxaldehydes and uses thereof in augmenting or enhancing the aromas of perfume compositions, colognes and perfumed articles. 4,622,171, Cl. 252-522.00R.
Spring, Robert J.: *See—*
Caldwell, Donald B.; and Spring, Robert J., 4,621,693, Cl. 166-311.000.
Springer, Timothy J., to Marvel Metal Products Co. Ergonomic forearm rest for use with keyboards. 4,621,781, Cl. 248-118.000.
Sprossler, Bruno: *See—*
Ottofrickenstein, Hans; Plainer, Hermann; Sprossler, Bruno; and Uhlig, Helmut, 4,622,300, Cl. 435-105.000.
Spruck, Helmut, to Leybold-Heraeus GmbH. Electron beam gun mounting on a work chamber. 4,622,453, Cl. 219-121.0ET.
Spruijt, Aloysius M. J. M.: *See—*
Hoogeveen, Leonardus P. J.; Peeters, Hendrikus W. C. M.; and Spruijt, Aloysius M. J. M., 4,622,661, Cl. 369-280.000.
Spruijt, H. J. N., to Agence Spatiale Europeenne. Method of and circuit for Ni-Cd battery charge control. 4,622,509, Cl. 320-36.000.
Squirea, John P.; Kronisch, Alan D.; Freeman, John J.; and Touchton, James J., to MiniScribe Corporation. Method and apparatus for controlling a motor. 4,622,499, Cl. 318-254.000.
Srikrishnan, Kris V.: *See—*
Fouts, David P.; Gupta, Devandra; Ho, Paul S.; Jaspal, Jasvir S.; Lloyd, James R., Jr.; Oberschmidt, James M.; Srikrishnan, Kris V.; and Sullivan, Michael J., 4,622,205, Cl. 420-566.000.
Srinivasan, Rangaswamy: *See—*
Leary-Renick, Pamela A.; and Srinivasan, Rangaswamy, 4,622,058, Cl. 65-105.000.
SRO Kugellagerwerke J. Schmidt-Roost AG: *See—*
Borel, Denis, 4,621,875, Cl. 384-45.000.
SSP Pumps Limited: *See—*
Ellis, George W., 4,621,994, Cl. 418-206.000.
Stabeg Apparatebaugesellschaft m.b.h.: *See—*
Salansky, Werner, 4,621,812, Cl. 273-29.00A.
Stahl, Glenn L.: *See—*
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,622,386, Cl. 530-307.000.
Stahl, Joseph A.: *See—*
Chang, Winston H.; Sprague, Robert A.; and Stahl, Joseph A., 4,622,079, Cl. 148-11.50F.
Standard Oil Company, The: *See—*
Bennett, Phillip D.; and Currie, John C., 4,622,611, Cl. 361-433.000.
Callahan, James L.; Miller, Arthur F.; and Shaw, Wilfrid G., 4,622,424, Cl. 562-545.000.
D'Intino, Joseph; Eckman, Carl E.; and Burgess, Lester E., 4,622,046, Cl. 44-51.000.
Standard Oil Company (Indiana): *See—*
Hirschberg, Eugene H.; and Horecky, Carl J., 4,622,210, Cl. 422-144.000.
Standard Telephones and Cables Public Limited Company: *See—*
Crownshaw, John C., 4,622,197, Cl. 264-230.000.
Dwyer, Douglas F. G.; and Bower, David E., 4,621,530, Cl. 73-517.00R.

Mackay, Malcolm D., 4,622,242, Cl. 427-163.000.

Standley, Paul M.: *See—*
Quick, Terrence R.; Standley, Paul M.; Foley, Mark P.; Howerton, Anderson W.; Miranti, Joseph P., Jr.; Oliver, Larry R.; Holloway, Gerald C., Jr.; and Richmond, Kenneth D., 4,622,023, Cl. 474-93.000.

Stanley Aviation Corporation: *See—*
Foster, Frank L., 4,621,840, Cl. 285-81.000.

Stanley Works: *See—*
DeCarolis, Joseph P., 4,621,718, Cl. 192-43.000.
Stoutenberg, Carl C., 4,621,425, Cl. 30-162.000.

Starck, Alexander, to Siemens Aktiengesellschaft. Method and apparatus for transmitting digital luminance and chrominance television signals. 4,622,579, Cl. 358-13.000.

Starek, Daniel A. Integrated soap bar and brush. 4,621,934, Cl. 401-19.000.

Stark, Josef: *See—*
Gossmann, Willi; Pape, Gebhard; Klupfel, Norbert; and Stark, Josef, 4,621,402, Cl. 29-407.000.

Starr, Lionel: *See—*
Mulhollan, James S.; and Starr, Lionel, 4,621,640, Cl. 128-340.000.

Staskiewicz, Vincent P.; and Spector, George. Board straightener. 4,621,791, Cl. 254-17.000.

Staufenberg, Charles W., Jr.; and Hubbell, Robert J. Piezoelectric electromechanical translation apparatus and method. 4,622,483, Cl. 310-328.000.

Stauffer Chemical Company: *See—*
Iacobucci, Paul A., 4,622,310, Cl. 502-208.000.
Walsh, Edward N., 4,622,276, Cl. 429-46.000.

Stefanski, Andrew; Sturtevant, Alfred H.; Konicek, Michael G.; and Lobban, Peter E., to Sequoia-Turner Corporation. Fluorescence intensity compensation method and device. 4,622,468, Cl. 250-458.100.

Stem, Stephen C., to Shell Oil Company. Economic combinative solvent and catalytic dewaxing process employing methylisopropyl ketone as the solvent and a silicate-based catalyst. 4,622,130, Cl. 208-87.000.

Stensele Mekaniska Verkstad AB: *See—*
Hedlund, Bo, 4,621,495, Cl. 60-447.000.

Stepan, Donald C.; Waller, Dan J.; and Drews, J. George, to IGT. Amusement device having juxtaposed video displays. 4,621,814, Cl. 273-138.00A.

Stephens, Lawrence K., to International Business Machines Corp. Geometrical display generator. 4,622,641, Cl. 364-518.000.

Stevens, Henry C.: *See—*
Briody, Robert G.; and Stevens, Henry C., 4,622,431, Cl. 568-606.000.

Steward, Neil D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Trade and Industry in Her Britanic Majesty's Government of the. Casting of metallic materials. 4,621,676, Cl. 164-485.000.

Stich, Frederick A., to Siemens Energy & Automation, Inc. Gating of the thyristors in an arcless tap changing regulator. 4,622,513, Cl. 323-343.000.

Stickels, Charles A.; and Mack, Claude M., to Ford Motor Company. Formable, temperature-resistant martensitic steel having enhanced resistance to wear. 4,622,081, Cl. 420-111.000.

Stockdale, Roy, to Napco Security Systems, Inc. Intrusion detection system. 4,622,541, Cl. 340-566.000.

Stolfi, Fred R.: *See—*
Eventoff, Arnold T.; and Stolfi, Fred R., 4,622,501, Cl. 318-627.000.

Stoltman, Donald D.: *See—*
Blythe, James S.; Dinkel, Michael J.; and Stoltman, Donald D., 4,621,772, Cl. 239-585.000.

Stone, Wayne B., Jr., to Wood Manufacturing Co., Inc. Displacement type coffee maker. 4,622,230, Cl. 426-433.000.

Stoner, Barry L.: *See—*
Schwarz, Frederick M.; and Stoner, Barry L., 4,621,520, Cl. 73-40.000.

Storage Technology Corporation: *See—*
Norton, David E., Jr., 4,622,599, Cl. 360-31.000.

Stoutenberg, Carl C., to Stanley Works. Retractable knife handle. 4,621,425, Cl. 30-162.000.

Stracey, Stanley T.: *See—*
Salem, Eli; Muller, Raymond J.; and Stracey, Stanley T., 4,622,141, Cl. 210-189.000.

Strader, Don S., to Goodyear Tire & Rubber Company, The. Conveyor belt damage sensor. 4,621,727, Cl. 198-810.000.

Stramer, Raymond F., to Universal Gym Equipment, Inc. Leg and hip exercising apparatus. 4,621,807, Cl. 272-117.000.

Strand, David A.: *See—*
Yaniv, Zvi; Strand, David A.; and Vala, John D., 4,622,654, Cl. 365-108.000.

Strange, Patrick E.: *See—*
Slaats, Mathew A.; and Strange, Patrick E., 4,621,868, Cl. 297-347.000.

Straub, Robert D., to General Motors Corporation. Tube coupling. 4,621,843, Cl. 285-356.000.

Streit, Werner; Bassing, Dieter; Gebert, Karlheinz; Klippel, Friedrich; and Leppert, Norbert, to BASF Aktiengesellschaft. Bleaching cotton-containing fabrics with hypochlorite at elevated temperatures. 4,622,037, Cl. 8-108.100.

Strike, Donald P.: *See—*
Schiehser, Guy A.; and Strike, Donald P., 4,622,402, Cl. 548-212.000.

Strobeck, George W., to Phillips Petroleum Company. Laminate with plastic film. 4,622,252, Cl. 428-88.000.

Stuart, Alan R., to General Electric Company. Counterrotating power turbine. 4,621,978, Cl. 416-127.000.

Stuart, Donald C.: *See—*
Robertson, Robert; and Stuart, Donald C., 4,622,201, Cl. 376-192.000.

Stump, Lee E.; David, Eugene C.; and Boehne, Dale, to Timesavers, Inc. Segmented platen with diaphragm cylinder control. 4,621,459, Cl. 51-138.000.

Sturm, Alfred: *See—*
Kaiser, Horst; Heinzmann, Ulrich; and Sturm, Alfred, 4,621,674, Cl. 164-103.000.

Sturtevant, Alfred H.: *See—*
Stefanski, Andrew; Sturtevant, Alfred H.; Konicek, Michael G.; and Lobban, Peter E., 4,622,468, Cl. 250-458.100.

Sturz, Wolfgang: *See—*
Boley, Dieter; Illig, Egon; and Sturz, Wolfgang, 4,621,854, Cl. 294-88.000.

Sudo, Yukio, to Atsugi Motor Parts Company, Limited. Rotary-vane compressor. 4,621,986, Cl. 417-304.000.

Suga, Akira; and Okino, Tadashi, to Canon Kabushiki Kaisha. Image pickup apparatus. 4,622,596, Cl. 358-335.000.

Sugihara, Masahiro: *See—*
Nakamura, Toshiyuki; Sugihara, Masahiro; Inaba, Tsutomu; and Kimura, Tadashi, 4,621,993, Cl. 418-55.000.

Sugimoto, Naoyasu: *See—*
Nakashima, Noriyuki; Ishiguro, Yoshinori; Kamiya, Kohji; Miyata, Hiroshi; Nakamura, Kazumasa; and Sugimoto, Naoyasu, 4,621,832, Cl. 280-707.000.

Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, to House Food Industrial Company Ltd. Microwave drying apparatus and use thereof. 4,622,446, Cl. 219-10.55R.

Sugita, Shigehisa: *See—*
Noguchi, Yoshiki; Arakawa, Tadao; Nagasaki, Nobuo; Sugita, Shigehisa; and Takeuchi, Masato, 4,622,275, Cl. 429-19.000.

Sugita, Yutaka: *See—*
Hosoe, Yuzuru; Ohta, Norio; Andoo, Keikichi; and Sugita, Yutaka, 4,622,264, Cl. 428-332.000.

Sugiura, Muneharu: *See—*
Kato, Masatake; and Sugiura, Muneharu, 4,621,905, Cl. 350-427.000.

Sugo, Takanobu; Okamoto, Jiro; Ishigaki, Isao; and Katakai, Akio, to Japan Atomic Energy Research Institute. Uranium adsorbing material and process for preparing the same. 4,622,366, Cl. 525-380.000.

Sukigara, Kunio; and Taniguchi, Harutaka, to Fuji Electric Co., Ltd.; and Fuji Electric Corporate Research & Development Ltd. Infrared gas analyzer. 4,622,464, Cl. 250-343.000.

Sullivan, Michael J.: *See—*
Crevasse, Gary A.; Gammon, David L.; and Sullivan, Michael J., 4,621,482, Cl. 53-439.000.
Fouts, David P.; Gupta, Devandra; Ho, Paul S.; Jaspal, Jasvir S.; Lloyd, James R., Jr.; Oberschmidt, James M.; Srikrishnan, Kris V.; and Sullivan, Michael J., 4,622,205, Cl. 420-566.000.

Sumigawa, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Steering device for an outboard motor. 4,622,015, Cl. 440-55.000.

Sumitomo Chemical Company, Limited: *See—*
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,622,063, Cl. 71-92.000.

Sumitomo Metal Mining Company Limited: *See—*
Ishikawa, Haruo; and Fujii, Yoshimasa, 4,622,663, Cl. 370-3.000.

Sunada, Masayoshi: *See—*
Mizunuma, Sinji; Sunada, Masayoshi; and Higuchi, Shigemitsu, 4,622,603, Cl. 360-78.000.

Sundblom, Leif J.; Rogers, Daniel D.; and Rogers, Wayne W., to Medical Instrument Development Laboratories, Inc. Variable pneumatic output means for use with ophthalmic micro-surgical instruments. 4,622,503, Cl. 318-645.000.

Sundstrand Corporation: *See—*
Glennon, Timothy F., 4,622,629, Cl. 363-70.000.

Sunnen Products Company: *See—*
Sunnen, Robert M.; Althen, Wayne W.; and Riehl, Rickey S., 4,621,455, Cl. 51-34.00R.

Sunnen, Robert M.; Althen, Wayne W.; and Riehl, Rickey S., to Sunnen Products Company. Combination horizontal/vertical honing machine. 4,621,455, Cl. 51-34.00R.

Superior Electric Company, The: *See—*
Lundin, Robert S., 4,622,686, Cl. 377-55.000.

Sure Shot of Louisiana, Inc.: *See—*
Poiencot, Mark D., 4,621,563, Cl. 89-37.040.

Surgikos, Inc.: *See—*
McAmish, Larry H.; Addy, Tralance O.; and Lee, George F., 4,622,259, Cl. 428-171.000.

Sussman, Morris, to Shore Plastics Inc. Method of filling a cosmetic container with push-up actuator. 4,621,935, Cl. 401-82.000.

Suzuhiro U.S.A., Inc.: *See—*
Okada, Minoru, 4,622,234, Cl. 426-643.000.

Suzuki, Akiyoshi; Ina, Hideki; and Takahashi, Kazuo, to Canon Kabushiki Kaisha. Optical apparatus including two afocal systems. 4,621,890, Cl. 350-6.100.

Suzuki, Nobuhiko: *See—*
Thomas, David L.; and Suzuki, Nobuhiko, 4,621,983, Cl. 417-222.000.

Suzuki, Shigeo; and Fujita, Tatsuo, to Kogata Gasu Reibo-Gijutsu Kenkyu Kumiai. Heat exchanger for internal combustion engine exhaust, with noise suppressor. 4,621,677, Cl. 165-135.000.

Suzuki, Shunichi, to NEC Corporation. Semiconductor memory. 4,622,655, Cl. 365-149.000.

Suzuki, Takashi: *See*—
Koikeda, Minoru; Suzuki, Takashi; Munemura, Koutaro; Nishimoto, Yoshihiko; and Imai, Tetsuya, 4,622,308, Cl. 502-66.000.

Suzuki, Togi; Konishi, Tadashi; Iohara, Kohichi; Ohwaki, Shinji; and Yamada, Setsuo, to Teijin Limited. Modified polyester fiber and process for preparation thereof. 4,622,381, Cl. 528-295.000.

Suzuki, Tomonori, to Sanshin Kogyo Kabushiki Kaisha. Water-cooled four-cycle internal combustion engine for outboard motors. 4,621,595, Cl. 123-41.720.

Suzuki, Toshihiko; Isawa, Nobuyuki; Ohkubo, Yasunori; and Hoshi, Kinji, to Sony Corporation. Apparatus for solidification with resistance heater and magnets. 4,622,211, Cl. 422-248.000.

Suzuki, Yasuhiro, to Fuji Seiki Machine Works, Ltd. Body for machining center. 4,621,407, Cl. 29-568.000.

Suzuki, Yasumichi: *See*—
Honjo, Takeshi; Kitahara, Makoto; Suzuki, Yasumichi; and Takahata, Naomi, 4,622,594, Cl. 358-293.000.

Svec, Frantisek: *See*—
Horak, Daniel; Metalova, Marie; Svec, Frantisek; Drobnik, Jaroslav; Kalal, Jaroslav; Kuzin, Michail I.; Adamian, Arnold A.; Moiseiev, Jurij V.; and Gumargalieva, Klara Z., 4,622,367, Cl. 525-381.000.

Sveen, Finn: *See*—
Bartels, Harold U.; and Sveen, Finn, 4,621,632, Cl. 128-203.270.

Swaim, William: *See*—
Spingath, Benjamin F., Jr., 4,621,987, Cl. 417-313.000.

Swan, William O.: *See*—
Zumchak, Eugene M.; and Swan, William O., 4,622,652, Cl. 364-900.000.

Swanson, David T., to VSL Corporation. Continuous prestressed concrete and method. 4,621,943, Cl. 404-70.000.

Swartley, John S., to Idea Network Company, Inc. Convection food heating. 4,622,231, Cl. 426-438.000.

Swedlow, Inc.: *See*—
Moncur, Marlowe V., 4,622,377, Cl. 526-323.200.

Swiss Aluminium Ltd.: *See*—
Kaiser, Horst; Heinzmann, Ulrich; and Sturm, Alfred, 4,621,674, Cl. 164-103.000.

Switchcraft, Inc.: *See*—
Long, Eric L.; and Brey, Anton, 4,621,754, Cl. 225-96.000.

Sykes, Jr.; Marvin E. Heat storage means. 4,621,614, Cl. 126-417.000.

Szatloczky, Erno ; Andor, Akos; Vucskits, Andras; Marai, Geza; and Palagyi nee Vajdovics, Erzsebet, to Novotrade RT. Growth-promoter fodders and feed additives and process for their preparation. 4,622,341, Cl. 514-648.000.

Szczesny, David S.; and Root, John A., to AMP Incorporated. Ribbon cable connector with improved cover latch. 4,621,885, Cl. 339-91.00R.

Szporny, Laszlo : *See*—
Bernath, Gabor; Kobor, Jeno; Kalman, Alajos; Sohar, Pal; Fulop, Ferenc; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , 4,622,327, Cl. 514-294.000.
Bernath, Gabor; Kobor, Jeno ; Lazar, Janos; Motika, Gabor; Ezer, Elemer; Hajos, Gyorgy; Palosi, Eva; Denes, Laszlo ; and Szporny, Laszlo , 4,622,329, Cl. 514-307.000.

Szuminski, Gary F., to Rolls-Royce Inc. Turbomachine ejector nozzle. 4,621,769, Cl. 239-265.390.

Tabarelli, Werner; and Lobach, Ernst, to Perkin-Elmer Censor Anstalt. Device for the projection copying of masks onto a workpiece. 4,621,922, Cl. 355-41.000.

Tachibana, Akira, to Nissan Motor Company, Limited. System and method for automatically controlling vehicle speed. 4,622,636, Cl. 364-424.000.

Tachibana, Kunitaka: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Tachibana, Kunitaka; Tsuruoka, Takashi; Inouye, Shigeharu; and Watanabe, Tetsuro, 4,622,060, Cl. 71-86.000.

Tachikawa, Shinziro; Hada, Chikao; and Maeda, Isami, to Toyota Jidosha Kabushiki Kaisha. Mechanism for and method of shifting cam mechanisms in a press for pressing workpieces with depressed portions. 4,621,512, Cl. 72-325.000.

Taga, Kazumitsu: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, 4,622,446, Cl. 219-10.55R.

Taga, Yutaka: *See*—
Tsukamoto, Kazumasa; Taniguchi, Takuji; Kubo, Seitoku; and Taga, Yutaka, 4,621,710, Cl. 184-6.270.

Tagami, Etsuji: *See*—
Fukumura, Sadaaki; Tagami, Etsuji; Hashimoto, Takeji; and Tano, Hirofumi, 4,621,428, Cl. 33-18.100.

Taguchi, Masao, to Fujitsu Limited. Semiconductor memory. 4,622,570, Cl. 357-23.600.

Taiho Pharmaceutical Company Limited: *See*—
Fujii, Setsuro; Unemi, Norio; and Takeda, Setsuo, 4,622,325, Cl. 514-274.000.

Taillebois, Jacques A. J., to M.C.B. Device for optical code reading, by diascopy, and a process for manufacturing same. 4,622,461, Cl. 250-231.0SE.

Taisan Industrial Co., Ltd.: *See*—
Chiba, Yasutsune; Arima, Shizuo; Nozawa, Katsumi; and Nomura, Hideo, 4,621,771, Cl. 239-585.000.

Tajima, Yoshimitsu: *See*—
Mohri, Motoo; and Tajima, Yoshimitsu, 4,621,417, Cl. 29-623.100.

Takabayashi, Toshiyuki; Yasuda, Tomio; and Sano, Katsuhiro, to Aisin Seiki Kabushiki Kaisha. Electric power steering apparatus. 4,621,701, Cl. 180-79.100.

Takacs, Mark A.: *See*—
Araps, Constance J.; Kandetzke, Steven M.; and Takacs, Mark A., 4,622,383, Cl. 528-345.000.

Takada, Hideo: *See*—
Hamanaka, Nobuyuki; Takada, Hideo; and Arai, Yoshinobu, 4,622,410, Cl. 549-304.000.

Takadera, Ichiro; and Kuroda, Shigeru, to NHK Spring Co., Ltd. Stabilizer for motor vehicle. 4,621,831, Cl. 280-689.000.

Takagi, Atsushi; Izumi, Shigeru; Takahashi, Fuminobu; Sato, Chikara; Naitoh, Shinji; and Sonoda, Shinji, to Hitachi, Ltd.; and Tokyo Gas Co., Ltd. Chain-like self-moving robot and control system therefor. 4,621,532, Cl. 73-623.000.

Takagi, Toshinori: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,622,236, Cl. 427-38.000.

Takahashi, Fuminobu: *See*—
Takagi, Atsushi; Izumi, Shigeru; Takahashi, Fuminobu; Sato, Chikara; Naitoh, Shinji; and Sonoda, Shinji, 4,621,532, Cl. 73-623.000.

Takahashi, Izumi: *See*—
Moriki, Yasumitsu; Tanaka, Akira; and Takahashi, Izumi, 4,621,491, Cl. 59-7.000.

Takahashi, Kazuo: *See*—
Suzuki, Akiyoshi; Ina, Hideki; and Takahashi, Kazuo, 4,621,890, Cl. 350-6.100.

Takahashi, Susumu, to Olympus Optical Co., Ltd. Objective for an endoscope. 4,621,910, Cl. 350-469.000.

Takahashi, Takashi. Apparatus for changing rotational speed with the aid of clutching activity. 4,621,541, Cl. 74-786.000.

Takahashi, Toshio: *See*—
Namba, Yuzaburo; and Takahashi, Toshio, 4,622,208, Cl. 422-65.000.

Takahashi, Yoshiaki, to Fuji Photo Film Co., Ltd. Preconditioning a photosensitive drum prior to actual photocopying. 4,621,920, Cl. 355-3.00R.

Takahashi, Yoshinobu; Mori, Takanobu; Odanaka, Masamitsu; Murase, Haruo; and Kojima, Masayuki, to Toyota Jidosha Kabushiki Kaisha. Process for manufacturing an electrode. 4,621,420, Cl. 29-856.000.

Takahata, Naomi; and Honjo, Takeshi, to Canon Kabushiki Kaisha. Original feeding apparatus. 4,621,921, Cl. 355-14.0SH.

Takahata, Naomi: *See*—
Honjo, Takeshi; Kitahara, Makoto; Suzuki, Yasumichi; and Takahata, Naomi, 4,622,594, Cl. 358-293.000.

Takatani, Teruhiko: *See*—
Kanazawa, Hirotaka; Takatani, Teruhiko; Furutani, Shigeki; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,621,702, Cl. 180-140.000.

Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Koiji, to Fujisawa Pharmaceutical Co., Ltd. 3-(substituted-ethenyl or ethynyl-thiomethyl) cephems. 4,622,318, Cl. 514-200.000.

Take, Yoshiaki: *See*—
Ito, Sukenori; Take, Yoshiaki; and Hirayama, Takahisa, 4,622,026, Cl. 493-104.000.

Takeda, Setsuo: *See*—
Fujii, Setsuro; Unemi, Norio; and Takeda, Setsuo, 4,622,325, Cl. 514-274.000.

Takegahara, Takashi: *See*—
Kishi, Hajimu; Seki, Masaki; Takegahara, Takashi; and Onishi, Yasushi, 4,621,959, Cl. 409-84.000.

Takematsu, Tetsuo; Konnai, Makoto; Tachibana, Kunitaka; Tsuruoka, Takashi; Inouye, Shigeharu; and Watanabe, Tetsuro, to Meiji Seika Kaisha, Ltd. Herbicidal compositions and herbicidal processes. 4,622,060, Cl. 71-86.000.

Takeuchi, Kenji, to Aisin Seiki Kabushiki Kaisha. Actuating mechanism for gear transmissions. 4,621,536, Cl. 74-473.00R.

Takeuchi, Masato: *See*—
Noguchi, Yoshiki; Arakawa, Tadao; Nagasaki, Nobuo; Sugita, Shigehisa; and Takeuchi, Masato, 4,622,275, Cl. 429-19.000.

Takeuchi, Shigeo, to Takeuchi Tekko Kabushiki Kaisha. Method of polishing a vehicle. 4,622,246, Cl. 427-327.000.

Takeuchi, Shin, to Inoue Mtp Kabusiki Kaisha. Method for manufacturing decorative molding. 4,622,191, Cl. 264-134.000.

Takeuchi Tekko Kabushiki Kaisha: *See*—
Takeuchi, Shigeo, 4,622,246, Cl. 427-327.000.

Takeuchi, Tetsuya; Koshigoe, Katsuki; Ogino, Hiroshi; and Hayashi, Masaharu, to Kabushiki Kaisha Sokkisha. Verticality detecting apparatus for plumbing columns. 4,621,433, Cl. 33-286.000.

Takeuchi, Yasuhiro: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; and Takeuchi, Yasuhiro, 4,621,599, Cl. 123-300.000.

Takigawa, Nobuhiro: *See*—
Watanabe, Hideo; Kawasaki, Kanjiro; Kubo, Keishi; Hakiri, Minoru; and Takigawa, Nobuhiro, 4,622,565, Cl. 346-201.000.

Takigawa, Tatsuaki: *See*—
Asano, Toshihiko; and Takigawa, Tatsuaki, 4,621,542, Cl. 74-796.000.

Tamai, Jun: *See*—
Nitanda, Hiroshi; Mizutani, Morikazu; Yokoyama, Taketoshi; Tamai, Jun; and Okumura, Toru, 4,621,919, Cl. 355-3.0DR.

Tamata, Shin; and Horiuchi, Susumu, to Hitachi, Ltd. Process for solidifying radioactive waste. 4,622,175, Cl. 252-628.000.

Tamerlani, Giancarlo: *See*—
Cannata, Vincenzo; and Tamerlani, Giancarlo, 4,622,419, Cl. 562-401.000.
Tamura, Hisaaki, to Kabushiki Kaisha Toshiba. Pressure vessel of an X-ray detector. 4,622,466, Cl. 250-374.000.
Tamura, Keiichi: *See*—
Mori, Shinji; and Tamura, Keiichi, 4,621,836, Cl. 280-807.000.
Tanaka, Akira; and Miura, Hidetoshi, to Mitsubishi Paper Mills, Ltd. Silver halide photographic emulsion. 4,622,290, Cl. 430-574.000.
Tanaka, Akira: *See*—
Moriki, Yasumitsu; Tanaka, Akira; and Takahashi, Izumi, 4,621,491, Cl. 59-7.000.
Tanaka, Eiichiro: *See*—
Kinugasa, Kazumasa; Tanaka, Eiichiro; Tanaka, Yoshihiro; and Morita, Yoshiharu, 4,622,181, Cl. 260-397.400.
Tanaka, Hidehiko: *See*—
Ise, Hasahiro; Tanaka, Hidehiko; Machino, Katsuyuki; Matsubara, Toshiyuki; and Terasaka, Teiji, 4,622,535, Cl. 340-310.00R.
Ise, Masahiro; Tanaka, Hidehiko; Machino, Katsuyuki; Matsubara, Toshiyuki; and Terasaka, Teiji, 4,622,478, Cl. 307-354.000.
Tanaka, Hideo: *See*—
Torii, Shigeru; Tanaka, Hideo; Nogami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,622,178, Cl. 540-358.000.
Tanaka, Hirohisa: *See*—
Katsuyama, Mikizo; Fujii, Teruo; and Tanaka, Hirohisa, 4,622,591, Cl. 358-256.000.
Tanaka, Naoki, to Mitsubishi Denki Kabushiki Kaisha. Refrigeration system having auxiliary cooling for control of coolant flow. 4,621,501, Cl. 62-199.000.
Tanaka, Yoshihiro: *See*—
Kinugasa, Kazumasa; Tanaka, Eiichiro; Tanaka, Yoshihiro; and Morita, Yoshiharu, 4,622,181, Cl. 260-397.400.
Tandberg Data A/S: *See*—
Rudi, Guttorm, 4,622,606, Cl. 360-96.500.
Tang, Wai-Cheung, to Com Dev Ltd. Group delay equalizers using short circuit triple mode filters. 4,622,523, Cl. 333-28.00R.
Taniguchi, Harutaka: *See*—
Sukigara, Kunio; and Taniguchi, Harutaka, 4,622,464, Cl. 250-343.000.
Taniguchi, Masami: *See*—
Ishida, Hiroshi; Hirobe, Junichi; Tomi, Toshikazu; and Taniguchi, Masami, 4,621,802, Cl. 271-272.000.
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, to Minolta Camera KK. Camera system. 4,621,914, Cl. 354-21.000.
Taniguchi, Takuji: *See*—
Tsukamoto, Kazumasa; Taniguchi, Takuji; Kubo, Seitoku; and Taga, Yutaka, 4,621,710, Cl. 184-6.270.
Taniguchi, Tokuso. Automated catheter construction. 4,622,033, Cl. 604-172.000.
Tanimoto, Steven L.; and Pfeiffer, Joseph J., Jr., to Board of Regents, University of Washington. Data processing system having a pyramidal array of processors. 4,622,632, Cl. 364-200.000.
Tano, Hirofumi: *See*—
Fukumura, Sadaaki; Tagami, Etsuji; Hashimoto, Takeji; and Tano, Hirofumi, 4,621,428, Cl. 33-18.100.
Tanouchi, Tatsuji; Ushimoto, Junichi; Okabayashi, Satoru; and Ikegawa, Toshio, to Nippon Kodoshi Corporation. Electrolytic capacitor. 4,622,612, Cl. 361-433.000.
Tarbox, Robert H.: *See*—
King, Wendell B.; Rhoads, Ronald I.; and Tarbox, Robert H., 4,621,760, Cl. 228-112.000.
Tartusky Gosudarstvenny Universitet: *See*—
Mikelsaar, Raik-Khiio N., 4,622,014, Cl. 434-278.000.
Taylor, Alwyn H.: *See*—
Bedder, Paul L.; Moses, Peter R.; Patel, Bhupendra; Reise, Terrence F.; and Taylor, Alwyn H., 4,622,277, Cl. 429-94.000.
Taylor, D. Lansing: *See*—
Lanni, Frederick; Taylor, D. Lansing; and Waggoner, Alan S., 4,621,911, Cl. 350-524.000.
Taylor, Ronald T., to Thomson Components-Mostek Corporation. Bootstrapped driver circuit for high speed applications. 4,622,479, Cl. 307-482.000.
Tebel Machinefabrieken B.V.: *See*—
van der Velde, Ype Y.; and Bootsma, Athanasius A., 4,621,747, Cl. 222-137.000.
Teijin Limited: *See*—
Suzuki, Togi; Konishi, Tadashi; Iohara, Kohichi; Ohwaki, Shinji; and Yamada, Setsuo, 4,622,381, Cl. 528-295.000.
Tektronix, Inc.: *See*—
Whiteley, Stephen R., 4,622,475, Cl. 307-289.000.
Teledyne Industries, Inc.: *See*—
Lamb, C. Paul, 4,621,496, Cl. 60-479.000.
Telefonaktiebolaget LM Ericsson: *See*—
Jonsson, Stig R. E.; and Larsson, Lars-Erik A., 4,622,665, Cl. 370-100.000.
Temple, Victor A. K., to General Electric Company. High voltage semiconductor device having an improved DV/DT capability and plasma spreading. 4,622,572, Cl. 357-38.000.
Terada, Atsusuke; Naruto, Shunji; and Iizuka, Yoshio, to Sankyo Company Limited. Phenylalkanoic acid derivatives and their use. 4,622,421, Cl. 562-491.000.
Teran, Jorge: *See*—
Georgopoulos, George; Toledo, Manuel; and Teran, Jorge, 4,621,673, Cl. 160-168.00R.
Teranishi, Masahiro, to Kabushika Kaisha Toshiba. Filter device. 4,622,142, Cl. 210-238.000.
Terasaka, Teiji: *See*—
Ise, Hasahiro; Tanaka, Hidehiko; Machino, Katsuyuki; Matsubara, Toshiyuki; and Terasaka, Teiji, 4,622,535, Cl. 340-310.00R.
Ise, Masahiro; Tanaka, Hidehiko; Machino, Katsuyuki; Matsubara, Toshiyuki; and Terasaka, Teiji, 4,622,478, Cl. 307-354.000.
Termini, Charles F.: *See*—
Boudreau, Ronald B.; and Termini, Charles F., 4,621,877, Cl. 312-257.00R.
Terumo Kabushiki Kaisha: *See*—
Katsura, Yoshiro; Hagiwara, Kazuhiko; and Nomura, Osamu, 4,622,032, Cl. 604-122.000.
Tesch, Guenter H. Mat shaped composite body. 4,622,260, Cl. 428-173.000.
Teulon, Jean-Marie, to Carpibem. Phenyl-naphthyridines and drugs containing them, particularly anti-ulcer drugs. 4,622,328, Cl. 514-300.000.
Tews, Richard R.: *See*—
Sheldon, Donald A.; and Tews, Richard R., 4,622,030, Cl. 604-15.000.
Texaco Inc.: *See*—
Cox, Percy T.; Warren, Wayne F.; and Johnson, Donald L., Jr., 4,622,518, Cl. 324-341.000.
Knifton, John F.; and Grice, Neal J., 4,622,343, Cl. 518-700.000.
Texas Instruments Incorporated: *See*—
Crossland, Robert E.; and Cooper, Erwin E., 4,621,888, Cl. 350-1.200.
Dudley, Dana, 4,622,587, Cl. 358-167.000.
Havemann, Robert H.; and Porter, Vernon R., 4,621,411, Cl. 29-571.000.
McElroy, David J., 4,622,653, Cl. 365-49.000.
Shih, Hung-Dah, 4,622,083, Cl. 148-175.000.
Texas United Chemical Corp.: *See*—
Mondshine, Thomas C., 4,621,692, Cl. 166-281.000.
Th. Goldschmidt AG: *See*—
Lattek, Horst; Fink, Hans-Ferdi; and Koerner, Gotz, 4,621,521, Cl. 73-60.100.
Thakkar, Mahendra R.: *See*—
Shirley-Elgood, John R. R.; Roulstone, Geoffrey A.; and Thakkar, Mahendra R., 4,622,103, Cl. 202-185.00E.
Theta-J Corporation: *See*—
Rodriguez, Edward; and Estrov, Alexander, 4,622,627, Cl. 363-37.000.
Thibonnet, Bernard: *See*—
Bernasconi, Christian; Faure, Alain; and Thibonnet, Bernard, 4,622,047, Cl. 44-62.000.
Thiel, Robert; and Bielawski, Edward. Superheated material cooling car with heat deflectors that restrict sideways radiation. 4,621,793, Cl. 266-165.000.
Thies, Curt: *See*—
Lapka, Galen G.; Mason, Norbert S.; and Thies, Curt, 4,622,244, Cl. 427-213.320.
Thinnes, Thomas A. Child security device. 4,621,589, Cl. 119-96.000.
Third Hand, Inc., The: *See*—
Alt, Vernon J.; and Brogan, Thomas J., 4,621,528, Cl. 73-432.100.
THOM-McI: *See*—
Thompson, Thomas L., 4,622,257, Cl. 428-143.000.
Thomann, Roland; Witschi, Heinz; Brink, Heinz-Dieter; and Amann, Markus, to Polydrain, Inc. Drainage channel. 4,621,939, Cl. 404-4.000.
Thomas & Betts Corporation: *See*—
O'Loughlin, Francis A., 4,621,421, Cl. 29-874.000.
Thomas, David L.; and Suzuki, Nobuhiko, to Diesel Kiki Co., Ltd. Variable capacity wobble plate compressor with improved means for returning lubricating oil to crankcase. 4,621,983, Cl. 417-222.000.
Thompson, Donald M.: *See*—
Lanciaux, Francis, 4,621,438, Cl. 34-77.000.
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., to Petrolite Corporation. Imidazoline compounds containing sulfur and amino groups. 4,622,404, Cl. 548-353.000.
Thompson, Thomas L., to THOM-McI. Non-skid fiber/cement tile. 4,622,257, Cl. 428-143.000.
Thomson Components-Mostek Corporation: *See*—
Taylor, Ronald T., 4,622,479, Cl. 307-482.000.
Thomson-CSF: *See*—
Barre, Lucien, 4,622,621, Cl. 361-382.000.
Chapuis, Franck; Urbain, Guy; and Baubrand, Gilles, 4,622,588, Cl. 358-183.000.
Thurne Engineering Company Limited: *See*—
Hoyland, Trevor B., 4,621,479, Cl. 53-133.000.
Thurston, Antony N. Cutting tool attachment. 4,621,792, Cl. 266-70.000.
Tiger Industries, Inc.: *See*—
Hutchison, Marion E., 4,621,968, Cl. 414-311.000.
Timesavers, Inc.: *See*—
Stump, Lee E.; David, Eugene C.; and Boehne, Dale, 4,621,459, Cl. 51-138.000.
Tippmann, Robert T. Cooling method, system and apparatus for minimizing dehydration of fresh meat products and the like. 4,621,504, Cl. 62-285.000.
Tischer, James C.: *See*—
Roberts, John H.; and Tischer, James C., 4,622,048, Cl. 55-199.000.
TMC Corporation: *See*—
Krob, Erwin; and Bauer, Helmut, 4,621,829, Cl. 280-628.000.

Toben, Michael P.: *See*—
Martin, James L.; McCaskie, John E.; and Toben, Michael P., 4,622,110, Cl. 204-47.000.
Tobin, Thomas J.: *See*—
Chabala, Leonard V.; Haarsma, John; O'Leary, Rsymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,622,250, Cl. 428-35.000.
Togashi, Seigo. Method of driving a display device. 4,622,590, Cl. 358-241.000.
Toki, Susumu: *See*—
Kawada, Keiichi; Okuyama, Takahiro; and Toki, Susumu, 4,621,597, Cl. 123-90.270.
Tokita, Takashi: *See*—
Nakazawa, Tadahisa; Usui, Koichi; Ogawa, Masahide; Abe, Kiyoshi; and Tokita, Takashi, 4,622,166, Cl. 252-313.100.
Tokumo, Akio; Kunugi, Yoshiro; Yoshimi, Toshikazu; Kato, Shinjiro; Sasaki, Yoshio; Odaka, Makoto; and Sato, Takeshi, to Pioneer Electronic Corporation. Mobile sound field correcting device. 4,622,691, Cl. 381-86.000.
Tokura, Koichi: *See*—
Itoh, Ken; Tokura, Koichi; and Fukada, Shigeyuki, 4,622,664, Cl. 370-86.000.
Tokuse, Masahiro: *See*—
Yamamura, Takemi; Tokuse, Masahiro; and Furushima, Teruhisa, 4,622,270, Cl. 428-608.000.
Tokyo Gas Co., Ltd.: *See*—
Takagi, Atsushi; Izumi, Shigeru; Takahashi, Fuminobu; Sato, Chikara; Naitoh, Shinji; and Sonoda, Shinji, 4,621,532, Cl. 73-623.000.
Tokyo Juki Industrial Co., LTD: *See*—
Okabayashi, Mitumasa; and Shiga, Norio, 4,622,505, Cl. 318-696.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ochiai, Nobuo; and Tsumagari, Takashi, 4,622,098, Cl. 156-645.000.
Ozawa, Tamotsu, 4,621,652, Cl. 134-95.000.
Shimamura, Yukio; Tsukuda, Yoshihiro; and Maeda, Ikuo, 4,622,640, Cl. 364-483.000.
Toledo, Manuel: *See*—
Georgopoulos, George; Toledo, Manuel; and Teran, Jorge, 4,621,673, Cl. 160-168.00R.
Tollas, Gabor: *See*—
Horvath, Erzsebet; and Tollas, Gabor, 4,622,222, Cl. 424-89.000.
Tollner, Klaus, to Montanwerke Walter GmbH. Multiple-part holding arrangement, in particular for concentrically rotating tools. 4,621,960, Cl. 409-232.000.
Tomi, Toshikazu: *See*—
Ishida, Hiroshi; Hirobe, Junichi; Tomi, Toshikazu; and Taniguchi, Masami, 4,621,802, Cl. 271-272.000.
Tomihashi, Nobuyuki: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,622,364, Cl. 525-200.000.
Tomii, Kaoru: *See*—
Miyama, Hiroshi; Kawauchi, Yoshikazu; Tomii, Kaoru; and Nishida, Jun, 4,622,497, Cl. 315-366.000.
Tomita, Kazuo; and Igarashi, Kouhei, to Toyota Jidosha Kabushiki Kaisha. Optimum shift timing indicating device for a vehicle. 4,622,637, Cl. 364-424.100.
Tomizawa, Ichiro: *See*—
Shimizu, Takafumi; and Tomizawa, Ichiro, 4,622,438, Cl. 379-63.000.
Tomkiewicz, Yaffa: *See*—
Grobman, Warren D.; Ho, Fahfu; Hurst, Jerry E., Jr.; Ritsko, John J.; and Tomkiewicz, Yaffa, 4,622,095, Cl. 156-635.000.
Tomlinson, Terence R.; and Cummings, Donald R., to Petrocarbon Developments Limited. Separation of hydrocarbon mixtures. 4,622,053, Cl. 62-26.000.
Tomooka, Walter K. Solid fuel heating apparatus. 4,621,610, Cl. 126-61.000.
Toppan Printing Co., Ltd.: *See*—
Ito, Sukenori; Take, Yoshiaki; and Hirayama, Takahisa, 4,622,026, Cl. 493-104.000.
Toray Industries, Inc.: *See*—
Ando, Katsutoshi; Nishiura, Eiichi; and Yamamoto, Yoshiyuki, 4,622,263, Cl. 428-288.000.
Nishimura, Akira; Maeda, Kunio; and Kito, Kazuo, 4,622,254, Cl. 428-102.000.
Torgeson, William L., to University of Pittsburgh. Membrane oxygenator and method and apparatus for making the same. 4,622,206, Cl. 422-48.000.
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Toth, Dennis M. Auxiliary arrow holder apparatus. 4,621,606, Cl. 124-24.00A.
Touchton, James J.: *See*—
Squires, John P.; Kronisch, Alan D.; Freeman, John J.; and Touchton, James J., 4,622,499, Cl. 318-254.000.
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Eidenschink, Rudolf; Romer, Michael; Weber, Georg; Gray, George W.; and Toyne, Kenneth J., 4,622,164, Cl. 252-299.630.
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Hashizume, Yoshiki, 4,622,073, Cl. 106-290.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Satoh, Takao; Murakami, Masaki; Kawasaki, Nobuhiro; Ichisaka, Teruo; and Katayama, Shinji, 4,622,113, Cl. 204-98.000.
Watanabe, Hiroyuki; and Seita, Toru, 4,622,112, Cl. 204-81.000.
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Komatsu, Yuichiro; and Maruyama, Toshio, 4,621,463, Cl. 51-281.00C.
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Kobayashi, Masao; Ishida, Nobuyuki; and Toyoda, Yoshihiro, 4,621,985, Cl. 417-250.000.
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Nakashima, Noriyuki; Ishiguro, Yoshinori; Kamiya, Kohji; Miyata, Hiroshi; Nakamura, Kazumasa; and Sugimoto, Naoyasu, 4,621,832, Cl. 280-707.000.
Onodera, Takayoshi; and Kagata, Toru, 4,621,717, Cl. 192-36.000.
Tachikawa, Shinziro; Hada, Chikao; and Maeda, Isami, 4,621,512, Cl. 72-325.000.
Takahashi, Yoshinobu; Mori, Takanobu; Odanaka, Masamitsu; Murase, Haruo; and Kojima, Masayuki, 4,621,420, Cl. 29-856.000.
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Toyota Motor Corporation: *See*—
Tsukamoto, Kazumasa; Taniguchi, Takuji; Kubo, Seitoku; and Taga, Yutaka, 4,621,710, Cl. 184-6.270.
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Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, 4,622,318, Cl. 514-200.000.
Trainor, Willis H.; and Weltlich, Gary P., to ADB-Alnaco, Inc. Adjustable light base and transformer housing. 4,622,435, Cl. 174-57.000.
Tran, Kim N. T., to Litton Systems, Inc. Method for manufacturing low resistance sub-micron gate Schottky barrier devices. 4,621,415, Cl. 29-589.000.
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Re, Ronald, 4,621,544, Cl. 74-863.000.
Transue, James A.; and Golden, Donald M., to Ethicon, Inc. Surgical instrument with hydraulic actuator. 4,621,639, Cl. 128-339.000.
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Ceccon, Claude R.; and Kovara, Joseph N., 4,622,633, Cl. 364-200.000.
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DiRegolo, Joseph A.; and Hauser, Hugo, 4,621,743, Cl. 215-308.000.
Trounson, James E.: *See*—
Rogers, Albert J.; Smith, Michael E.; and Trounson, James E., 4,622,194, Cl. 264-162.000.
Trutek Research, Inc.: *See*—
Nowacki, Christopher; and Brisson, Alfred G., 4,621,634, Cl. 128-204.180.
Truth Incorporated: *See*—
Paulson, Gary F.; and Vetter, Gregory J., 4,621,847, Cl. 292-199.000.
Trutzschler GmbH & Co. KG: *See*—
Hosel, Fritz, 4,622,645, Cl. 364-560.000.
TRW Inc.: *See*—
Basham, Jack K.; Ho, Kenton T. T.; and Mrozek, Eric M., 4,622,683, Cl. 375-90.000.
Brookbank, Earl B., III, 4,621,689, Cl. 166-106.000.
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Wier, Franz, 4,621,394, Cl. 24-642.000.
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Tschudin-Mahrer, Rolf, to Irbit Holding AG. Foam sealing strip package. 4,621,731, Cl. 206-83.500.
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Tsukagoshi, Minoru; Nakayama, Takuo; Minagawa, Masahiko; and Yoshida, Shuji, to Shikoku Chemicals Corporation. Process for producing copper through-hole printed circuit board. 4,622,097, Cl. 156-644.000.
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Ochiai, Nobuo; and Tsumagari, Takashi, 4,622,098, Cl. 156-645.000.
Tsunashima, Mikiyasu: *See*—
Yamada, Izumi; Yamamoto, Hajime; and Tsunashima, Mikiyasu, 4,622,202, Cl. 376-246.000.
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Yamashita, Keitaro; and Tsuneki, Keizo, 4,622,614, Cl. 360-118.000.
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Kaku, Toshimitsu; Nakao, Takeshi; and Tsunoda, Yoshito, 4,622,564, Cl. 346-160.000.
Tsuruoka, Mitsuharu; and Sasaki, Keiji, to Victor Company of Japan, Ltd. Tape cassette adapter having a motor for driving tape draw-out means thereof to form a predetermined tape path therein. 4,622,605, Cl. 360-94.000.
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Tu, Chia-Chi; Wauters, Ronald P.; and Kenyon, Ralph E., to General Foods Corporation. Method of preparing yeast-leavened bread crumbs. 4,622,225, Cl. 426-27.000.
Tuovinen, Heikki; Rinne, Kauko K.; Honkaniemi, Matti; Heikkila, Risto M.; and Jankkila, Martti, to Outokumpu Oy. Method and device for clamping the electrode contact shoes around the electrode of an electric furnace. 4,622,677, Cl. 373-101.000.
Turner, John H. W., to Alcan International Limited. Surface coating compositions. 4,622,072, Cl. 106-252.000.
Tuttle, Mark E.: *See*—
Babcock, Walter C.; Tuttle, Mark E.; and Brooke, James W., 4,622,344, Cl. 521-28.000.
Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez F.; and Fung, Kwok K., 4,621,502, Cl. 62-223.000.
Ube Industries, Ltd.: *See*—
Yamamura, Takemi; Tokuse, Masahiro; and Furushima, Teruhisa, 4,622,270, Cl. 428-608.000.
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Uchimura, Kuniharu; and Iwata, Atushi, to Nippon Telegraph & Telephone Public Corporation. Switched capacitor circuit with high power supply projection ratio. 4,622,480, Cl. 307-491.000.
Uchinishi, Eizaburo, to Kawasaki Jukogyo Kabushiki Kaisha. Exhaust control system. 4,621,596, Cl. 123-65.0PE.
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Uda, Yoshihiro, to NEC Corporation. Light emitting diode driver circuit. 4,622,477, Cl. 307-311.000.
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Ottofrickenstein, Hans; Plainer, Hermann; Sprossler, Bruno; and Uhlig, Helmut, 4,622,300, Cl. 435-105.000.
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Sakurai, Seiji; and Umino, Kaoru, 4,622,070, Cl. 106-38.220.
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Fujii, Setsuro; Unemi, Norio; and Takeda, Setsuo, 4,622,325, Cl. 514-274.000.
Uniden Corporation: *See*—
Baba, Yoshihiko; and Endo, Hiroshi, 4,622,553, Cl. 342-91.000.
Union Carbide Corporation: *See*—
Aronson, Robert G., 4,621,952, Cl. 406-138.000.
Gill, William A.; and Gerkin, Richard M., 4,622,361, Cl. 524-710.000.
Koleske, Joseph V.; and McCarthy, Neil J., Jr., 4,622,349, Cl. 522-31.000.
Uniroyal Englebert Textilcord S.A.: *See*—
Goerens, Robert L., 4,622,235, Cl. 427-25.000.
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Wilcock, Peter D., 4,621,965, Cl. 414-7.000.
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Eidenschink, Rudolf; Romer, Michael; Weber, Georg; Gray, George W.; and Toyne, Kenneth J., 4,622,164, Cl. 252-299.630.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Trade and Industry in Her Britanic Majesty's Government of the: *See*—
Steward, Neil D., 4,621,676, Cl. 164-485.000.
United States Forgecraft Corporation: *See*—
Bailey, James T., Jr., 4,621,851, Cl. 294-82.200.
United States Gypsum Company: *See*—
Balinski, Henry A., 4,621,470, Cl. 52-241.000.
Kuhr, Albert F.; and Wendt, Alan C., 4,621,471, Cl. 52-288.000.
Wendt, Alan C., 4,621,473, Cl. 52-489.000.
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Air Force: *See*—
Andres, James R.; and Wilson, Donald D., 4,622,548, Cl. 340-753.000.
Bryant, Stephen M.; and Speir, Donald J., 4,622,556, Cl. 342-174.000.
Westerfield, Edwin E., 4,622,557, Cl. 342-357.000.
Army: *See*—
Bryant, Gordon H., 4,621,646, Cl. 128-692.000.
Lohmann, Gerd, 4,621,893, Cl. 350-6.500.
Phillips, Welton E., 4,621,519, Cl. 73-35.000.
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Abernathy, Bethel R.; and Walters, Ronald R., 4,622,049, Cl. 55-250.000.
Arnold, Charles, Jr.; Hughes, Robert C.; Kepler, R. Glen; and Kurtz, Steven R., 4,622,355, Cl. 524-89.000.
Bickes, Robert W., Jr.; Kopczewski, Michael R.; and Schwarz, Alfred C., 4,621,577, Cl. 102-200.000.
Gelles, David S.; Ghoniem, Nasr M.; and Powell, Roger W., 4,622,067, Cl. 420-61.000.
Gold, Raymond; and McElroy, William N., 4,622,200, Cl. 376-159.000.
Hammond, Joseph P.; David, Stan A.; and Woodhouse, John J., 4,621,761, Cl. 228-124.000.
Hammond, Peter R., 4,622,400, Cl. 546-179.000.
Janey, Mark A., 4,622,215, Cl. 423-440.000.
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Picciolo, Grace L.; and Kaplan, David S., 4,622,291, Cl. 435-4.000.
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Hergenrother, Paul M.; and Jensen, Brian J., 4,622,182, Cl. 260-544.00P.
von Pragenau, George L., 4,621,492, Cl. 60-258.000.
Navy: *See*—
Andrews, Grealie A.; and Sheller, Samuel L., 4,622,552, Cl. 342-196.000.
Hankley, Donald W., 4,622,016, Cl. 440-70.000.
Kim, Oh-Kil, 4,622,266, Cl. 428-394.000.
Lagakos, Nicholas; Cole, James H.; and Bucaro, Joseph A., 4,621,896, Cl. 350-96.290.
U.S. Philips Corporation: *See*—
Barten, Piet G. J., 4,622,492, Cl. 313-422.000.
Beurskens, Johannes H. H.; and Roelevink, Bauke J., 4,622,488, Cl. 313-318.000.
Diemer, Willem H.; Kikkert, John N.; and Wagemans, Hubertus F. M., 4,622,688, Cl. 378-143.000.
Dil, Jan G.; and Bartsen, Johan W., 4,622,096, Cl. 156-643.000.
Harig, Egon H. A.; and Martens, Gerd H., 4,622,465, Cl. 250-373.000.
Loy, Fernand R., 4,621,902, Cl. 350-576.000.
Pals, Jan A.; and Klinkhamer, Arend J., 4,622,567, Cl. 357-23.100.
Reitsma, Jogchum, 4,622,585, Cl. 358-135.000.
Schemmann, Hugo; and Bukoschek, Romuald L., 4,621,423, Cl. 30-43.920.
Smeelen, Theodorus J. H., 4,622,495, Cl. 315-248.000.
Withoos, Wilhelmus H. C.; Leenders, Petrus J. M.; Benning, Franciscus H. C.; and van de Meij, Johannes, 4,622,560, Cl. 346-1.100.
United Technologies Corporation: *See*—
Marshall, Larry A.; and Lewis, David A., 4,621,976, Cl. 415-191.000.
Reavely, Richard T.; and Schmaling, David N., 4,621,980, Cl. 416-226.000.
Schwarz, Frederick M.; and Stoner, Barry L., 4,621,520, Cl. 73-40.000.
Zipps, Robert H.; Rynaski, Chester H.; and Fulton, Graham B., 4,621,979, Cl. 416-219.00R.
Universal Gym Equipment, Inc.: *See*—
Stramer, Raymond F., 4,621,807, Cl. 272-117.000.
University of California, The Regents of the: *See*—
Dureja, Prem; Casida, John E.; and Ruzo, Luis O., 4,622,315, Cl. 514-70.000.
Meares, Claude F.; Yeh, Simon M.; and Sherman, David G., 4,622,420, Cl. 562-443.000.
Shih, Cheng-Chung; and Gray, Paul R., 4,622,536, Cl. 340-347.0DA.
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Bodor, Nicholas S., 4,622,218, Cl. 424-9.000.
University of Miami: *See*—
Hsia, Sung L.; Voigt, Walter; Sawaya, Marty; and Zeoli, Kathryn, 4,622,317, Cl. 514-178.000.
University of Michigan, The Regents of the: *See*—
Wieland, Donald M., 4,622,217, Cl. 424-1.100.
University of Minnesota, Regents of the: *See*—
Anderson, Robert K.; Foster, Ruth E.; and Levine, Jeffrey A., 4,621,591, Cl. 119-130.000.
University of Pittsburgh: *See*—
Torgeson, William L., 4,622,206, Cl. 422-48.000.
University Patents, Inc.: *See*—
Liu, Qing-Guo; and Worrell, Wayne L., 4,622,105, Cl. 204-1.00T.
UOP Inc.: *See*—
Urban, Peter; and Ginger, Edward A., 4,622,213, Cl. 423-242.000.
Up-Right, Inc.: *See*—
Claxton, Gerald L., 4,621,488, Cl. 56-330.000.
Urano, Fumio: *See*—
Kawasaki, Masahiro; Okura, Zenichi; and Urano, Fumio, 4,621,918, Cl. 354-448.000.
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Chapuis, Franck; Urbain, Guy; and Baubrand, Gilles, 4,622,588, Cl. 358-183.000.
Urban, Peter; and Ginger, Edward A., to UOP Inc. Sulfur dioxide removal from gas streams. 4,622,213, Cl. 423-242.000.

Urbanski, Jeffrey C.: *See—*
Anderson, Philip M., III; and Urbanski, Jeffrey C., 4,622,543, Cl. 340-572.000.

Urlacher, Jean-Pierre; and Lang, Denis, to Kuhn S.A. Haying machines for facilitating transport thereof. 4,621,487, Cl. 56-228.000.

Ushimoto, Junichi: *See—*
Tanouchi, Tatsuji; Ushimoto, Junichi; Okabayashi, Satoru; and Ikegawa, Toshio, 4,622,612, Cl. 361-433.000.

USM Corporation: *See—*
Binder, Hans, 4,621,586, Cl. 112-121.120.
Masada, Daizo, 4,621,967, Cl. 414-225.000.

Usui, Koichi: *See—*
Nakazawa, Tadahisa; Usui, Koichi; Ogawa, Masahide; Abe, Kiyoshi; and Tokita, Takashi, 4,622,166, Cl. 252-313.100.

Vala, John D.: *See—*
Yaniv, Zvi; Strand, David A.; and Vala, John D., 4,622,654, Cl. 365-108.000.

Validec, Inc.: *See—*
Lowrance, Eugene S., 4,622,274, Cl. 429-1.000.

Vallieres, Yves; and Granier, Georges, to Societe Nationale des Poudres et Explosifs. Pyrotechnic initiator using a coaxial connector. 4,621,578, Cl. 102-202.900.

Valpak Oy: *See—*
Berghall, Christer K.; Ollikainen, Jukka S.; and Koskivaara, Timo T., 4,621,969, Cl. 414-331.000.

Van, Dinh P., to Dow Chemical Company, The. Rubber-reinforced polymeric resins containing a mineral fiber. 4,622,351, Cl. 523-212.000.

Vanago, Joseph. Integral peripheral locking device for closures. 4,621,845, Cl. 292-37.000.

van de Meij, Johannes: *See—*
Withoos, Wilhelmus H. C.; Leenders, Petrus J. M.; Benning, Franciscus H. C.; and van de Meij, Johannes, 4,622,560, Cl. 346-1.100.

van der Graaf, Meine H., to Machinefabriek en Technische Handelsonderneming M.H. van der Graaf B.V. Method of securing a cover to the end of a thin-walled tube and the article produced thereby. 4,621,400, Cl. 29-123.000.

van der Schyf, Cornelis J.: *See—*
Dekker, Theodor G.; Oliver, Douglas W.; Snyckers, Friedrich O.; and van der Schyf, Cornelis J., 4,622,430, Cl. 564-458.000.

van der Velde, Ype Y.; and Bootsma, Athanasius A., to Tebel Machinefabrieken B.V. Apparatus for charge-wise dosing a metered volume quantity of a flowing medium continuously supplied to the apparatus under delivery pressure. 4,621,747, Cl. 222-137.000.

Vanelderen, Yvon L.; Raskin, Christian L. G.; Mortier, Rene E. J.; and Dompas, John M. A., to Hazelett Strip-Casting Corporation. Process and apparatus for continuous casting. 4,621,675, Cl. 164-481.000.

Van Gemert, Barry, to PPG Industries, Inc. Sulfamoyl urea derivatives. 4,622,065, Cl. 71-93.000.

Vapor Corporation: *See—*
McInerney, Michael J., 4,621,592, Cl. 122-250.00R.

Varga, Otto H.; and Robbins, Montague A., to Seetru Limited. Flat glass sight gauge. 4,621,527, Cl. 73-329.000.

Vaupel, Knut: *See—*
Schulz, Peter; Klein, Jurgen; and Vaupel, Knut, 4,622,008, Cl. 432-95.000.

VDO Adolf Schindling AG: *See—*
Kant, Bernhard; and Lauth, Hans-Georg, 4,621,526, Cl. 73-304.00R.

Veg-Gasinstituut N.V.: *See—*
Dalhuisen, Peter B., 4,622,004, Cl. 431-76.000.

Vellinga, Sjoerd H. J., to Paques B.V. Plant for the anaerobic purification of waste water. 4,622,147, Cl. 210-539.000.

Venkatesh, Bhimachar, to Advanced Micro Devices, Inc. Temperature compensated active resistor. 4,622,476, Cl. 307-310.000.

Verbicky, John W., Jr.; and O'Neil, Elbridge A., to General Electric Company. Plasticized polyetherimide blends. 4,622,368, Cl. 525-426.000.

Vergason, Gary E.: *See—*
Bergman, Clark; and Vergason, Gary E., 4,622,452, Cl. 219-121.0PR.

Veseskis, Kenneth F.: *See—*
Hearn, Patrick L.; Riggle, Charles M.; Parikh, Shyam C.; and Veseskis, Kenneth F., 4,622,516, Cl. 324-163.000.

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Paulson, Gary F.; and Vetter, Gregory J., 4,621,847, Cl. 292-199.000.

Vickers System GmbH: *See—*
Schulz, Rene ; Braum, Heinrich J.; Nadolny, Kurt; and Nguyen, Van-Trung, 4,621,982, Cl. 417-201.000.

Victaulic Company PLC, The: *See—*
Ansell, Donald J., 4,622,087, Cl. 156-242.000.

Victor Company of Japan, Limited: *See—*
Hirota, Akira; and Higurashi, Seiji, 4,622,597, Cl. 358-343.000.
Tsuruoka, Mitsuharu; and Sasaki, Keiji, 4,622,605, Cl. 360-94.000.

Video Research Limited: *See—*
Watanabe, Fumio; and Itoh, Yoshikazu, 4,622,583, Cl. 358-84.000.

Villa, Jose L.: *See—*
Bardoliwalla, Dinshaw F.; and Villa, Jose L., 4,622,370, Cl. 526-75.000.

Virginia Chemicals, Inc.: *See—*
Winslow, Charles E., Jr.; Bush, Joseph L.; and Dickens, Daniel D., 4,622,216, Cl. 423-515.000.

Viskase Corporation: *See—*
Raudys, Vytas A., 4,621,392, Cl. 17-49.000.

VLT Gesellschaft fur Verfahrenstechnische Entwicklung mbH: *See—*
Schreiber, Georg, 4,621,928, Cl. 366-137.000.

Vock, Manfred H.: *See—*
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., 4,622,171, Cl. 252-522.00R.

Voges, Dieter: *See—*
Merger, Franz; Voges, Dieter; and Winderl, Siegfried, 4,622,428, Cl. 564-480.000.

Voigt, Walter: *See—*
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Vollmuth, Lawrence P.: *See—*
Qureshi, Gulzar A.; Morrison, Daniel P.; Hijuelos, Humberto A.; and Vollmuth, Lawrence P., 4,621,399, Cl. 29-33.00D.

von Pragenau, George L., to United States of America, National Aeronautics and Space Administration. Low loss injector for liquid propellant rocket engines. 4,621,492, Cl. 60-258.000.

von Thun, Hans-Jurgen, to Brown, Boveri, and Cie A.G. Circuit layout for the simulation of moments of inertia on test stands. 4,621,524, Cl. 73-116.000.

Vora, Chandra R.; Ziegler, Michael L.; Bagula, Mark; and Hamilton, Steve, to Data General Corporation. Data processing system having unique bus control protocol. 4,622,630, Cl. 364-134.000.

Vora, Madhukar B.; and Herndon, William H., to Fairchild Semiconductor Corporation. Integrated circuit bipolar memory cell. 4,622,575, Cl. 357-59.000.

Voss, Lorenz, to Otto Junker GmbH. Coreless induction furnace. 4,622,679, Cl. 373-152.000.

VSL Corporation: *See—*
Swanson, David T., 4,621,943, Cl. 404-70.000.

Vucskits, Andras: *See—*
Szatloczky, Erno ; Andor, Akos; Vucskits, Andras; Marai, Geza; and Palagyi nee Vajdovics, Erzsebet, 4,622,341, Cl. 514-648.000.

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Becker, Helmut; and Wohlfart, Walter, 4,622,625, Cl. 362-304.000.

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Wheeler, William K., 4,621,806, Cl. 272-93.000.

W/S Group Inc.: *See—*
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W. Schneider & Co. AG Metallwarenfabrik: *See—*
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Wada, Masatoshi: *See—*
Akai, Yoshito; Konaga, Nobuyuki; Arisato, Yasunori; Wada, Masatoshi; and Moritsu, Yukikazu, 4,622,069, Cl. 106-1.110.

Wada, Yuichi: *See—*
Mori, Sadao; Yorozuya, Tsuruo; Wada, Yuichi; and Shinozaki, Yasuhide, 4,622,533, Cl. 337-114.000.

Waddoups, Ray O.: *See—*
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Wade, Wallace R.: *See—*
Rao, Vemulapalli D. N.; and Wade, Wallace R., 4,621,593, Cl. 123-1.00A.

Wagemans, Hubertus F. M.: *See—*
Diemer, Willem H.; Kikkert, John N.; and Wagemans, Hubertus F. M., 4,622,688, Cl. 378-143.000.

Wager, Oleg. Vertical drain. 4,622,138, Cl. 210-170.000.

Waggoner, Alan S.: *See—*
Lanni, Frederick; Taylor, D. Lansing; and Waggoner, Alan S., 4,621,911, Cl. 350-524.000.

Wagner, Keith R.; and Miller, Richard L., to Wagner, Keith R. Personalized shoe emblem signature. 4,621,441, Cl. 40-2.00E.

Wagner, Wolfram: *See—*
Bueb, Michael; Paulini, Dieter; Muschelknautz, Edgar; Wagner, Wolfram; and Groschel, Herbert, 4,622,195, Cl. 264-168.000.

Wakamatsu, Kazutoshi: *See—*
Okihara, Naoto; Aihara, Yoshiki; and Wakamatsu, Kazutoshi, 4,622,484, Cl. 310-328.000.

Wakefield, Douglas H., to Corning Limited. Tubular coupler with retainer. 4,621,841, Cl. 285-158.000.

Wako Pure Chemical Industries, Ltd.: *See—*
Ikenaka, Tokuji; and Omichi, Kaoru, 4,622,295, Cl. 435-22.000.
Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,622,296, Cl. 435-26.000.

Wakui, Tadahiro; and Handa, Tadahiko. Metal oxide having uniform pore sizes, the process for producing said metal oxide, and catalyst carrier comprising the said metal oxide. 4,622,311, Cl. 502-235.000.

Waldorf Corporation: *See—*
Roccaforte, Harry I., 4,621,736, Cl. 206-606.000.

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Walker, James L.: *See—*
Iovine, Carmine P.; Palmer, Joseph G.; and Walker, James L., 4,622,374, Cl. 526-263.000.

Walker, Jerry L.; Crummett, Donald L.; and Behling, William C., to Jet Research Center, Inc.; and Halliburton Company. Manufacturing of shaped charge carriers. 4,621,396, Cl. 29-1.300.

Wallach, David: *See—*
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Waller, Dan J.: *See—*
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Waller, John C.; and Searle, Gregory C. L., to Commonwealth of Australia of c/-Department of Defence Support, The. Arrangements for correcting compasses. 4,622,646, Cl. 364-571.000.

Walsh, Edward N., to Stauffer Chemical Company. Fuel cell electrolyte. 4,622,276, Cl. 429-46.000.

Walsh, Reed H., to Lubrizol Corporation, The. Aqueous systems containing organo-borate compounds. 4,622,158, Cl. 252-49.300.

Walters, Ronald R.: *See*—
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Walters, William R.: *See*—
Schneider, Lon M.; and Walters, William R., 4,622,526, Cl. 333-181.000.

Walther, Gerhard: *See*—
Casals-Stenzel, Jorge; Weber, Karl-Heinz; Walther, Gerhard; Harreus, Albrecht; and Muacevic, Gojko, 4,622,319, Cl. 514-220.000.

Walton, Michael A.: *See*—
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Wang, Joseph Y., to Miles Laboratories, Inc. Reagent test device having sealed matrix boundaries. 4,622,207, Cl. 422-56.000.

Wang, Leao. Multi-function gymnastic device. 4,621,623, Cl. 128-72.000.

Warner & Swasey Company, The: *See*—
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Warren, Wayne F.: *See*—
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Washington University, The: *See*—
Lapka, Galen G.; Mason, Norbert S.; and Thies, Curt, 4,622,244, Cl. 427-213.320.

Watanabe, Fumio; and Itoh, Yoshikazu, to Video Research Limited. Audience rating measuring system. 4,622,583, Cl. 358-84.000.

Watanabe, Hideo; Kawasaki, Kanjiro; Kubo, Keishi; Hakiri, Minoru; and Takigawa, Nobuhiro, to Ricoh Company, Ltd. Multi-colored image recording method and thermosensitive image transfer sheet for use in the recording method. 4,622,565, Cl. 346-201.000.

Watanabe, Hiroyuki; Hamada, Eiichi; Hayashi, Motomu; and Ono, Kenji, to Toyota Jidoshi Kabushiki Kaisha. Construction of door in motor vehicle. 4,621,453, Cl. 49-374.000.

Watanabe, Hiroyuki; and Seita, Toru, to Toyo Soda Manufacturing Co., Ltd. Process for preparing chlorinated polyvinyl aromatic compounds. 4,622,112, Cl. 204-81.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Printing apparatus with multiple ribbon cassettes holder. 4,622,563, Cl. 346-76.0PH.

Watanabe, Tetsuro: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Tachibana, Kunitaka; Tsuruoka, Takashi; Inouye, Shigeharu; and Watanabe, Tetsuro, 4,622,060, Cl. 71-86.000.

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Watjen, Frank; Engelstoft, Mogens; Hansen, John B.; and Jensen, Leif H., to AS Ferrosan. Oxadiazolylimidazobenzodiazepine, compositions, and method. 4,622,320, Cl. 514-220.000.

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Watkinson, William J.: *See*—
Perring, John; and Watkinson, William J., 4,621,867, Cl. 297-341.000.

Watson Karcey International: *See*—
Karcey, Jon, 4,622,136, Cl. 210-168.000.

Watson, Kenneth E.; and Sharp, Keith W., to NL Industries, Inc. Liquid polymer containing compositions for thickening aqueous systems. 4,622,153, Cl. 252-8.514.

Wauters, Ronald P.: *See*—
Tu, Chia-Chi; Wauters, Ronald P.; and Kenyon, Ralph E., 4,622,225, Cl. 426-27.000.

Weaver, Jon N., to Controlled Information Corporation. Magnetic article surveillance system, method and coded marker. 4,622,542, Cl. 340-572.000.

Webb, Leslie, to Kernforschungsanlage Julich GmbH. Method of and apparatus for simultaneously filling the cup-shaped cavities of a microbeaker plate. 4,621,665, Cl. 141-1.000.

Webb, Roger C. Garden tiller attachment. 4,621,697, Cl. 172-42.000.

Weber, Georg: *See*—
Eidenschink, Rudolf; Romer, Michael; Weber, Georg; Gray, George W.; and Toyne, Kenneth J., 4,622,164, Cl. 252-299.630.

Weber, Herbert; and Lier, Hans-Peter, to ANT Nachrichtentechnik GmbH. Transmission system for TV signals on radio links. 4,622,694, Cl. 455-47.000.

Weber, Karl-Heinz: *See*—
Casals-Stenzel, Jorge; Weber, Karl-Heinz; Walther, Gerhard; Harreus, Albrecht; and Muacevic, Gojko, 4,622,319, Cl. 514-220.000.

Wegemund, Bernd: *See*—
Fischer, Herbert; Wegemund, Bernd; Gorzinski, Manfred; and Gress, Wolfgang, 4,622,382, Cl. 528-295.300.

Wegmann, Urs; and Rille, Eduard, to Balzers Aktiengesellschaft. Apparatus for coating materials by cathode sputtering. 4,622,121, Cl. 204-298.000.

Wegwerth, Wolfgang, to American Metal-Tech, Ltd. Gun barrel, mandrel and related processes. 4,622,080, Cl. 148-12.00R.

Wehinger, Egbert; Meyer, Horst; and Knorr, Andreas, to Bayer Aktiengesellschaft. Asymmetric diesters of Hantzsch dihydropyridines with hypotensive activity. 4,622,332, Cl. 514-356.000.

Wehmeier, William C.: *See*—
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Wehrle, Karlheinz J.: *See*—
Grande, Robert; de Kluizenaar, Cornelis J.; Naunapper, Dietmar C.; and Wehrle, Karlheinz J., 4,621,437, Cl. 34-10.000.

Weilow, Gerth, to Hennix i Stockholm AB. Joint. 4,621,938, Cl. 403-217.000.

Weinreich, Stephen. Digital screen display apparatus. 4,621,443, Cl. 40-436.000.

Weinstein, Mark F.; and Yerkes, Craig H. Quick release assembly with integral lock. 4,621,873, Cl. 301-124.00R.

Weiss, Johannes S.: *See*—
Graves, Alan F.; Littlewood, Paul A.; and Weiss, Johannes S., 4,622,666, Cl. 370-100.000.

Weiss, Jorn-Volker, to Huels Aktiengesellschaft. Epoxy resin-diammonium salt emulsion and process for its production. 4,622,353, Cl. 523-401.000.

Weixel, Mark S., to Westinghouse Electric Corp. Harness formation finger interchange. 4,621,409, Cl. 29-568.000.

Weldon, William F., to Board of Regents, Univ. of Texas System. Switch for inductive energy store transfer circuit. 4,621,561, Cl. 89-8.000.

Wells, Norman B.: *See*—
Kowal, Leonard J.; Schwarz, Albert J.; and Wells, Norman B., 4,621,842, Cl. 285-322.000.

Weltlich, Gary P.: *See*—
Trainor, Willis H.; and Weltlich, Gary P., 4,622,435, Cl. 174-57.000.

Wendt, Alan C., to United States Gypsum Company. Field attachment clip for wall panels. 4,621,473, Cl. 52-489.000.

Wendt, Alan C.: *See*—
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Wenger, Terry L.: *See*—
Buske, Gary R.; Wenger, Terry L.; and Beyrau, John A., 4,622,160, Cl. 252-73.000.

Wengert, Rolf; and Cicchi, Pietro, to Siemens Aktiengesellschaft. Luminescent screen for picture display apparatus and method for manufacturing such device. 4,622,272, Cl. 428-690.000.

Wersosky, John M., to Ex-Cell-O Corporation. Multiple zone heating of molds. 4,621,995, Cl. 425-144.000.

West, Charles R.: *See*—
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West, John L.; and Russell, James T., to Digital Recording Corporation. Process of using metal azide recording media with laser. 4,622,284, Cl. 430-290.000.

Westberg, Knut S., to A-Betong AB. Prestressable passage core. 4,621,787, Cl. 249-63.000.

Westendorf Mfg. Co., Inc.: *See*—
Langenfeld, Joseph W.; and Westendorf, Neal W., 4,621,973, Cl. 414-686.000.

Westendorf, Neal W.: *See*—
Langenfeld, Joseph W.; and Westendorf, Neal W., 4,621,973, Cl. 414-686.000.

Westerfield, Edwin E., to United States of America, Air Force. Transdigitizer for relaying signals from global positioning system (GPS) satellites. 4,622,557, Cl. 342-357.000.

Westhoff, James A.: *See*—
Ditcher, Jack; Ditcher, Eric; and Westhoff, James A., 4,621,941, Cl. 404-26.000.

Westinghouse Electric Corp.: *See*—
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Nokovich, Nick, 4,621,549, Cl. 82-1.200.
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Wiersema, Dale T.; and Kirschensteiner, Fred, 4,621,850, Cl. 294-81.610.

Westlund, Arnold E., Jr.; and Hughes, Freddie P., to GTE Products Corporation. Electric lamp with stress relieving means. 4,622,487, Cl. 313-273.000.

Wexler, Barry A., to Du Pont de Nemours, E. I., and Company. Herbicidal N-[(4,6-substituted pyrimidin-2-yl)aminocarbonyl]-substituted fused pyrazole-3-sulfonamides. 4,622,062, Cl. 71-90.000.

Wheeler, William K., to W. K. Wheeler, Inc. Therapeutic apparatus. 4,621,806, Cl. 272-93.000.

Whelan, Patrick: *See*—
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., 4,622,171, Cl. 252-522.00R.

Whipple, Charles E.: *See*—
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Whitaker, Stephen; and Iversen, Arthur H., to Iversen, Arthur H. Liquid cooled anode x-ray tubes. 4,622,687, Cl. 378-130.000.

Whitaker, Sterling R., to American Microsystems, Inc. Combinational logic structure using PASS transistors. 4,622,648, Cl. 364-715.000.

Whiteley, Stephen R., to Tektronix, Inc. Data storage element having input and output ports isolated from regenerative circuit. 4,622,475, Cl. 307-289.000.

Whiting, Douglas L., to Motorola, Inc. Channel scan allocation arrangement. 4,622,695, Cl. 455-58.000.

Whittlinger, David E., to Sherex Chemical Company, Inc. Stabilizer for amine/quaternary ammonium blends. 4,622,168, Cl. 252-352.000.

Whitwell, Robert J.: *See*—
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Whynacht, Charles; and Hall, Robert E., to Otis Elevator Company. Remote monitoring system state machine and method. 4,622,538, Cl. 340-506.000.
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Widera, Axel: *See*—
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Wieland, Donald M., to University of Michigan, The Regents of the. I-4-amino-3-iodobenzylguanidine as imaging and therapeutic agent. 4,622,217, Cl. 424-1.100.
Wier, Franz, to TRW Repa GmbH. Buckle for a safety belt. 4,621,394, Cl. 24-642.000.
Wier, Jan H. Fastening and a fastener member. 4,621,783, Cl. 248-245.000.
Wiersema, Dale T.; and Kirschensteiner, Fred, to Westinghouse Electric Corp. Coil removal apparatus for a dynamoelectric generator. 4,621,850, Cl. 294-81.610.
Wiethaup, Wolfgang: *See*—
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Wilcock, Peter D., to United Kingdom Atomic Energy Authority. Manipulators. 4,621,965, Cl. 414-7.000.
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Willi Studer AG: *See*—
Doi, Toshitada; Brandes, Claudia; and Lagadec, Roger, 4,622,598, Cl. 360-22.000.
Williams, Calvin. Grease filtering apparatus. 4,622,135, Cl. 210-167.000.
Williams, Haydn; and Rokach, Joshua, to Merck Frosst Canada, Inc. 6-H dibenz[b,f]thiepin compounds. 4,622,403, Cl. 548-252.000.
Williams, James F. Beam pump. 4,621,567, Cl. 92-13.700.
Williams, Samuel G. L., to Lockheed Missiles & Space Company, Inc. Optical alignment apparatus. 4,621,924, Cl. 356-153.000.
Williamson, David T. N., to Molins PLC; and Smith, John C., Jr. Automated machine installation and method. 4,621,410, Cl. 29-568.000.
Willinger, Allan H., to Willinger Bros., Inc. Aquarium filter system. 4,622,148, Cl. 210-615.000.
Willinger Bros., Inc.: *See*—
Willinger, Allan H., 4,622,148, Cl. 210-615.000.
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Wilson, Donald D.: *See*—
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Wilson, Peggy M.; and Muegge, Ernest L., to Mobil Oil Corporation. Use of a liquid membrane for scale removal. 4,621,694, Cl. 166-312.000.
Wilson, Syd R.: *See*—
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Winn, Geraldine Betty, legal representative: *See*—
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Winn, Martin: *See*—
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Carr, Michael J. R.; Sennett, Colin; Wilkinson, Brian; and Winn, Russell E., deceased, 4,621,562, Cl. 89-41.050.
Winslow, Charles E., Jr.; Bush, Joseph L.; and Dickens, Daniel D., to Virginia Chemicals, Inc. Treatment of sodium dithionite reaction mixture. 4,622,216, Cl. 423-515.000.
Winstanley, Ralph. Grinding machine for mowing machine cylinder blades. 4,621,456, Cl. 51-48.0HE.
Winter, Heinrich: *See*—
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Wirz, Arno, to Heidelberger Druckmaschinen AG. Sheet-fed rotary printing presses for single-side printing or first form and perfector printing. 4,621,576, Cl. 101-230.000.
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Withoos, Wilhelmus H. C.; Leenders, Petrus J. M.; Benning, Franciscus H. C.; and van de Meij, Johannes, to U.S. Philips Corporation. Linewise interference/band suppression printing system. 4,622,560, Cl. 346-1.100.
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Thomann, Roland; Witschi, Heinz; Brink, Heinz-Dieter; and Amann, Markus, 4,621,939, Cl. 404-4.000.
Witt, Paul R.: *See*—
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Wolf, Gerhard D.: *See*—
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Wolf, Johann, to Johann Wolf Gesellschaft m. b. H. Apparatus for joining mutually contacting beams or the like by means of nail slabs. 4,621,759, Cl. 227-152.000.
Wolters, Erich: *See*—
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Wong, Pui K., to Shell Oil Company. Amorphous ethylene/propylene polymers. 4,622,375, Cl. 526-284.000.
Wood, Eric, to Insituform Holdings Limited. Lining of pipelines and passageways. 4,622,196, Cl. 264-229.000.
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Woodhouse, John J.: *See*—
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Woods, Lee O.; Hilty, Ronald L.; and Kornrumpf, William P., to General Electric Company. Pressure sensing devices and methods, control devices and methods of operating same, smart pressure switches, air conditioning systems and devices for controlling same. 4,621,503, Cl. 62-228.300.
Worley, Robert F., to Donn Incorporated. Grid connectors for suspension ceiling. 4,621,474, Cl. 52-667.000.
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Wu, Schyi-yi: *See*—
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Wurfel, Reinhart; Zangenfeind, Helmut; Domges, Gunther; and Kugel, Raimund, to Agfa-Gevaert Aktiengesellschaft. Apparatus for removing reels with exposed roll films from cartridges. 4,621,970, Cl. 414-412.000.
Wykoff, Richard H.: *See*—
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Wynne, Kenneth J.; Marks, Tobin J.; and Inabe, Tamotsu, to Northwestern University. Electrically conductive cofacially crystallizing organomacrocycle forming compositions. 4,622,170, Cl. 252-518.000.
Wyvratt, Matthew J., Jr., to Merck & Co., Inc. O-sulfate derivatives of avermectins and milbemycins having improved water solubility. 4,622,313, Cl. 514-30.000.
Xerox Corporation: *See*—
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Yamada, Akira: *See*—
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Yamada, Izumi; Yamamoto, Hajime; and Tsunashima, Mikiyasu, to Hitachi, Ltd. Reactor in-vessel sensor and core monitoring apparatus. 4,622,202, Cl. 376-246.000.
Yamada, Kazuo: *See*—
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Yamada, Masaharu; and Konno, Iseo, to Kabushiki Kaisha Yamada Kohgaku Seisakusho; and Shin Nihon Tsusho Kabushiki Kaisha. Microscope with projector. 4,621,913, Cl. 353-39.000.
Yamada, Mitsuhiko, to Dainippon Screen Seizo Kabushiki Kaisha. Asynchronous color image processing system with a plurality of picture input units and a plurality of picture reproducing units selected in accordance with a predetermined order of preference. 4,622,582, Cl. 358-80.000.
Yamada, Setsuo: *See*—
Suzuki, Togi; Konishi, Tadashi; Iohara, Kohichi; Ohwaki, Shinji; and Yamada, Setsuo, 4,622,381, Cl. 528-295.000.
Yamada, Shingo; and Yamada, Kazuo, to Ryowa Engineering Co., Ltd.; and Nagoya General Bond Co. Ltd. Method of and apparatus for injecting an adhesive. 4,622,085, Cl. 156-94.000.
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Yamamoto, Toshio, to Kabushiki Kaisha Universal. Reel assembly for slot machines. 4,621,815, Cl. 273-143.00R.
Yamamoto, Yoshiyuki: *See*—
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Yamamura, Takemi; Tokuse, Masahiro; and Furushima, Teruhisa, to Ube Industries, Ltd. Inorganic fiber-reinforced metallic composite material. 4,622,270, Cl. 428-608.000.

Yamanishi, Kazuhiko; and Hanada, Toshiro, to Wako Pure Chemical Industries, Ltd. Process for measuring activity of dehydrogenase employing a reaction stopper. 4,622,296, Cl. 435-26.000.

Yamanouchi, Junichi: *See*—
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Yamaoka, Takashi: *See*—
Kitahara, Katsuhiko; Masutani, Tetsuya; Yamaoka, Takashi; Kitahaba, Tetsuo; Nisioka, Takasi; and Itami, Yasuo, 4,622,066, Cl. 71-98.000.

Yamashita, Keitaro; and Tsuneki, Keizo, to Sony Corporation. Magnetic erasing head. 4,622,614, Cl. 360-118.000.

Yamazaki, Etuo, to Fanuc Ltd. Speed correcting device for use in speed command system. 4,622,504, Cl. 318-561.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device. 4,622,432, Cl. 136-246.000.

Yanai, Yoshimi: *See*—
Mori, Takanobu; Kashimura, Tetsuo; Fukui, Yutaka; Yanai, Yoshimi; and Iizuka, Nobuyuki, 4,621,499, Cl. 60-752.000.

Yaniv, Zvi; Strand, David A.; and Vala, John D., to Energy Conversion Devices, Inc. Liquid crystal light valve with memory. 4,622,654, Cl. 365-108.000.

Yankoff, Gerald K. Method and apparatus for machining. 4,621,547, Cl. 82-1.00C.

Yasnovsky, Vacheslav M.: *See*—
Godsay, Madhu P.; Hull, Michael N.; and Yasnovsky, Vacheslav M., 4,622,100, Cl. 162-65.000.
Hull, Michael N.; and Yasnovsky, Vacheslav M., 4,622,101, Cl. 162-65.000.

Yasuda, Makoto; and Murayama, Seiichi, to Hitachi, Ltd. High intensity ultraviolet light source. 4,622,493, Cl. 313-642.000.

Yasuda, Makoto: *See*—
Miyashita, Tsune; Yasuda, Makoto; Murayama, Seiichi; and Arai, Yoji, 4,622,485, Cl. 313-25.000.

Yasuda, Nobuyoshi: *See*—
Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, 4,622,318, Cl. 514-200.000.

Yasuda, Tomio: *See*—
Takabayashi, Toshiyuki; Yasuda, Tomio; and Sano, Katsuhiro, 4,621,701, Cl. 180-79.100.

Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, to Mitsui Petrochemical Industries, Ltd. Five-component copolyester, process for preparation thereof, and shaped articles thereof. 4,622,268, Cl. 428-480.000.

Yeda Research and Development Company Ltd.: *See*—
Revel, Michel; and Wallach, David, 4,622,292, Cl. 435-5.000.

Yeh, Simon M.: *See*—
Meares, Claude F.; Yeh, Simon M.; and Sherman, David G., 4,622,420, Cl. 562-443.000.

Yen, Robert C.: *See*—
Iseler, Kenneth A.; Guha, Probir K.; and Yen, Robert C., 4,622,354, Cl. 523-527.000.

Yerkes, Craig H.: *See*—
Weinstein, Mark F.; and Yerkes, Craig H., 4,621,873, Cl. 301-124.00R.

Yext, Walter F.; Hayduk, Edward A.; and Fisher, Clark K., to Air Products and Chemicals, Inc. Process for manufacturing thick-film electrical components. 4,622,240, Cl. 427-96.000.

Yokoyama, Shigeki; Yamanouchi, Junichi; Yoneyama, Masakazu; and Maekawa, Yukio, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material having improved antistaticity. 4,622,288, Cl. 430-527.000.

Yokoyama, Taketoshi: *See*—
Nitanda, Hiroshi; Mizutani, Morikazu; Yokoyama, Taketoshi; Tamai, Jun; and Okumura, Toru, 4,621,919, Cl. 355-3.0DR.

Yoneyama, Masakazu: *See*—
Yokoyama, Shigeki; Yamanouchi, Junichi; Yoneyama, Masakazu; and Maekawa, Yukio, 4,622,288, Cl. 430-527.000.

Yoon, Han Sik; Son, Tae Won; Lee, Chul Joo; and Min, Byung Ghyl, to Korea Advanced Institute of Science and Technology. Polymer alloy fiber and process therefor. 4,622,265, Cl. 428-364.000.

York, Norman N. Apparatus for removing tree stumps and splitting logs. 4,621,668, Cl. 144-3.00K.

Yorozuya, Tsuruo: *See*—
Mori, Sadao; Yorozuya, Tsuruo; Wada, Yuichi; and Shinozaki, Yasuhide, 4,622,533, Cl. 337-114.000.

Yoshida, Ryo: *See*—
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,622,063, Cl. 71-92.000.

Yoshida, Shuji: *See*—
Tsukagoshi, Minoru; Nakayama, Takuo; Minagawa, Masahiko; and Yoshida, Shuji, 4,622,097, Cl. 156-644.000.

Yoshimi, Toshikazu: *See*—
Tokumo, Akio; Kunugi, Yoshiro; Yoshimi, Toshikazu; Kato, Shinjiro; Sasaki, Yoshio; Odaka, Makoto; and Sato, Takeshi, 4,622,691, Cl. 381-86.000.

Yoshinaga, Toru: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; and Takeuchi, Yasuhiro, 4,621,599, Cl. 123-300.000.

Yotsumoto, Toshiyuki; and Umemoto, Tomeo, to Kubota, Ltd. Wheel tread adjusting apparatus. 4,621,872, Cl. 301-124.00H.

Young, Archie R.; Ho, Teh C.; Jacobson, Allan J.; and Chianelli, Russell R., to Exxon Research and Engineering Company. Hydrotreating catalysts comprising supported mixtures of a sulfide of trivalent chromium and molybdenum or tungsten. 4,622,128, Cl. 208-18.000.

Young, Robert F.: *See*—
Shabel, Barrie S.; and Young, Robert F., 4,621,523, Cl. 73-81.000.

Young, Roger A.: *See*—
Chyung, Kenneth; Dwyer, Thomas J.; Foster, Gordon F.; Shoup, Robert D.; and Young, Roger A., 4,622,057, Cl. 65-18.100.

Young, Warren C.: *See*—
Eyssa, Yehia M.; Boom, Roger W.; Young, Warren C.; McIntosh, Glen E.; and Abdelsalam, Mostafa K., 4,622,531, Cl. 335-216.000.

Youngbauer, Steven R. Nonrigid bow holster. 4,621,752, Cl. 224-253.000.

Yount, Larry J., to Sperry Corporation. Digital fail operational automatic flight control system utilizing redundant dissimilar data processing. 4,622,667, Cl. 371-9.000.

Yuen, Tony, to Lamarle. Date indexed food storage container. 4,621,670, Cl. 150-55.000.

Yuho Chemicals Inc.: *See*—
Gomi, Tadashi; Sakata, Kenji; Aoyama, Ichiro; and Sono, Nobuo, 4,622,360, Cl. 524-507.000.

Yuyama, Yasuaki; Kondo, Syunichi; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Light transmissible light-sensitive recording materials. 4,622,279, Cl. 430-66.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
Breitweg, Werner, 4,621,703, Cl. 180-143.000.

Zangenfeind, Helmut: *See*—
Wurfel, Reinhart; Zangenfeind, Helmut; Domges, Gunther; and Kugel, Raimund, 4,621,970, Cl. 414-412.000.

Zani, Giuseppe. Armchair structure having an adjustable anatomical configuration. 4,621,866, Cl. 297-284.000.

Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. L-aminodicarboxylic acid alkanes. 4,622,232, Cl. 426-548.000.

Zanno, Paul R.: *See*—
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., 4,622,417, Cl. 560-117.000.
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., 4,622,418, Cl. 560-117.000.

Zei, Dino, to Officine Panerai S.r.l. Luminous signalling plate, particularly suitable for the installation on the deck of a ship. 4,622,623, Cl. 362-84.000.

Zeller, Karl: *See*—
Frauenknecht, Josef; and Zeller, Karl, 4,622,045, Cl. 8-531.000.

Zeoli, Kathryn: *See*—
Hsia, Sung L.; Voigt, Walter; Sawaya, Marty; and Zeoli, Kathryn, 4,622,317, Cl. 514-178.000.

Ziegenfuss, Edward T., to RCA Corporation. Device for orienting an object on a flat surface. 4,621,797, Cl. 269-34.000.

Ziegler, Michael L.: *See*—
Vora, Chandra R.; Ziegler, Michael L.; Bagula, Mark; and Hamilton, Steve, 4,622,630, Cl. 364-134.000.

Ziegler, William H., Jr., to Hedstrom Corporation. Knock-down tricycle. 4,621,826, Cl. 280-259.000.

Ziemann, Heinz: *See*—
Baasner, Bernd; Ziemann, Heinz; and Klauke, Erich, 4,622,427, Cl. 564-261.000.

Zimmer, George A.: *See*—
Kern, John M.; and Zimmer, George A., 4,622,025, Cl. 474-245.000.

Zimmermann, Klaus-Dieter: *See*—
Polach, Wilhelm; and Zimmermann, Klaus-Dieter, 4,622,051, Cl. 55-417.000.

Zinser, Richard L., to General Electric Company. Hybrid subband coder/decoder method and apparatus. 4,622,680, Cl. 375-25.000.

Ziobro, Richard J.: *See*—
Leach, Robert M.; and Ziobro, Richard J., 4,622,248, Cl. 427-440.000.

Zipps, Robert H.; Rynaski, Chester H.; and Fulton, Graham B., to United Technologies Corporation. Fan rotor blades of turbofan engines. 4,621,979, Cl. 416-219.00R.

Zlotek, Thaddeus F., to Dana Corporation. Dual start drive system. 4,621,720, Cl. 192-48.920.

Zumchak, Eugene M.; and Swan, William O., to Applied Microsystems Corporation. Signal identification. 4,622,652, Cl. 364-900.000.

Zyss, Joseph: *See*—
Nicoud, Jean-Francois; and Zyss, Joseph, 4,622,409, Cl. 548-570.000.

501 Bruil-Arnhem Groep B.V.: *See*—
Jordense, Antonius P. M., 4,621,944, Cl. 404-75.000.

501 Hollandse Signaalapparaten B.V.: *See*—
Gellekink, Bernard; and Bisschop, Hilbert, 4,622,554, Cl. 342-67.000.

600 Group Public Limited Company, The: *See*—
Cook, Peter H.; and Hillyard, Derek W., 4,621,405, Cl. 29-48.50R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF NOVEMBER, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Apontoweil, Peter; and Krasselt, Manfred M., to Gist-Brocades N.V. Vaccines. Re. 32,283, Cl. 424-89.000.

Atasi Corporation: *See—*
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Garold W., Re. 32,285, Cl. 360-106.000.

Baer, Ralph H., to Sanders Associates, Inc. Television gaming apparatus. Re. 32,282, Cl. 273-85.00G.

Brown, Stanley F.: *See—*
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Garold W., Re. 32,285, Cl. 360-106.000.

Butler, Donald L.; and Martin, Thomas E. Spin cooler. Re. 32,280, Cl. 62-375.000.

Cassano, James R.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., Re. 32,284, Cl. 355-3.0SH.

Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Garold W., to Atasi Corporation. Linear actuator for a memory storage apparatus. Re. 32,285, Cl. 360-106.000.

Gibeau, Frank C.: *See—*
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Garold W., Re. 32,285, Cl. 360-106.000.

Gist-Brocades N.V.: *See—*
Apontoweil, Peter; and Krasselt, Manfred M., Re. 32,283, Cl. 424-89.000.

Hamlin, Thomas J.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., Re. 32,284, Cl. 355-3.0SH.

Hitachi, Ltd.: *See—*
Imai, Masumi; Takato, Masao; and Tokuda, Hiroastu, Re. 32,286, Cl. 364-431.040.

Imai, Masumi; Takato, Masao; and Tokuda, Hiroastu, to Hitachi, Ltd. Apparatus for electronically controlling internal combustion engine. Re. 32,286, Cl. 364-431.040.

Krasselt, Manfred M.: *See—*
Apontoweil, Peter; and Krasselt, Manfred M., Re. 32,283, Cl. 424-89.000.

Martin, Thomas E.: *See—*
Butler, Donald L.; and Martin, Thomas E., Re. 32,280, Cl. 62-375.000.

Plonczak, Garold W.: *See—*
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Garold W., Re. 32,285, Cl. 360-106.000.

Sanders Associates, Inc.: *See—*
Baer, Ralph H., Re. 32,282, Cl. 273-85.00G.

Smith, Richard E.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., Re. 32,284, Cl. 355-3.0SH.

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Document storage and transport apparatus. Re. 32,284, Cl. 355-3.0SH.

Takato, Masao: *See—*
Imai, Masumi; Takato, Masao; and Tokuda, Hiroastu, Re. 32,286, Cl. 364-431.040.

Tokuda, Hiroastu: *See—*
Imai, Masumi; Takato, Masao; and Tokuda, Hiroastu, Re. 32,286, Cl. 364-431.040.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Tsubo, Shuzo, Re. 32,281, Cl. 271-9.000.

Tsubo, Shuzo, to Tokyo Shibaura Denki Kabushiki Kaisha. Copy sheet-feeding apparatus. Re. 32,281, Cl. 271-9.000.

Xerox Corporation: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., Re. 32,284, Cl. 355-3.0SH.

LIST OF DESIGN PATENTEES

Adams Manufacturing: *See—*
Adams, William E., 286,612, Cl. D8-391.000.

Adams, William E., to Adams Manufacturing. Tack. 286,612, 11-11-86, Cl. D8-391.000.

Addison, Robert: *See—*
Ficho, William; and Addison, Robert, 286,683, Cl. D27-36.000.

Aderans Company, Ltd.: *See—*
Nemoto, Nobuo, 286,687, Cl. D28-93.000.

Advanced Evacuation Systems: *See—*
Forrest, William E., 286,688, Cl. D29-1.000.
Forrest, William E., 286,689, Cl. D29-1.000.

Allibert SA: *See—*
Deconinck, Didier, 286,592, Cl. D6-430.000.

American Home Products Corporation (Del): *See—*
Gatarz, Gregory M.; and Banasiak, Joseph G., 286,696, Cl. D32-45.000.

Aqua-Leisure Industries, Inc.: *See—*
Berenson, Steven M., 286,668, Cl. D21-239.000.

AT&T Technologies, Inc.: *See—*
Cooke, Kenneth R.; and Porcelli, Vito L., 286,636, Cl. D14-61.000.

Baisch, Herbert: *See—*
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 286,611, Cl. D8-381.000.

Ballard, Lannis P.; and Davis, William A., to G. & B. Davis Company. Combined shotgun stock and magazine. 286,669, 11-11-86, Cl. D22-108.000.

Banasiak, Joseph G.: *See—*
Gatarz, Gregory M.; and Banasiak, Joseph G., 286,696, Cl. D32-45.000.

Barthropp, Francis M. L. Toy gun. 286,660, 11-11-86, Cl. D21-147.000.

Barthropp, Francis M. L. Toy gun. 286,661, 11-11-86, Cl. D21-147.000.

Becker, Werner, to Fissan Dr. A. Sauer GmbH. Bottle. 286,616, 11-11-86, Cl. D9-389.000.

Bennett, Lewis W., to Itek Graphix Corp. Page composer console. 286,637, 11-11-86, Cl. D14-100.000.

Berenson, Steven M., to Aqua-Leisure Industries, Inc. Swim fin. 286,668, 11-11-86, Cl. D21-239.000.

Berk-Beccon B.V.: *See—*
Broere, Carl J., 286,605, Cl. D7-17.000.

Berry, Richard D., Jr., to Design Institute America, Inc. Table top. 286,598, 11-11-86, Cl. D6-511.000.

Bierlein, James R.; and Williams, James F. Tumbler. 286,604, 11-11-86, Cl. D7-15.000.

Black & Decker Inc.: *See—*
Hickman, Ronald P.; Secoura, Ralph J.; and Dunker, David M., 286,609, Cl. D8-74.000.

Blanchard, Russell, to John Thomas Batts, Inc. Garment hanger. 286,584, 11-11-86, Cl. D6-318.000.

Blanchard, Russell, to John Thomas Batts, Inc. Garment hanger. 286,585, 11-11-86, Cl. D6-319.000.

Bonsack Baths (London) Limited: *See—*
Griffiths, William H., 286,671, Cl. D23-55.000.

Bourgo, Edward A.: *See—*
Curtis, James J.; and Bourgo, Edward A., 286,606, Cl. D7-45.000.

Bowmer & Kirkland Product Sales Ltd.: *See—*
Morris, Alan R.; and Parker, Ronald P., 286,642, Cl. D15-10.000.

Brennan, Michael. Combined walking aid and cart. 286,625, 11-11-86, Cl. D12-130.000.

Brine, William H., Jr., to W. H. Brine Co. Lacrosse stick head. 286,666, 11-11-86, Cl. D21-210.000.

Britz, Elizabeth A. Invalid chair. 286,626, 11-11-86, Cl. D12-128.000.

Broere, Carl J., to Berk-Beccon B.V. Tureen. 286,605, 11-11-86, Cl. D7-17.000.

Brusadin, Giacomo, to Uniflex Utiltime S.p.A. Portable drum reel for flattened tube. 286,610, 11-11-86, Cl. D8-359.000.

Bulgari, Marina, to Marina B. Creation, S.A. Necklace. 286,623, 11-11-86, Cl. D11-6.000.

Bulgari, Marina, to Marina B. Creation, S.A. Bracelet. 286,624, 11-11-86, Cl. D11-6.000.

Burr, James D. Motor controlled focussing attachment for telescopes. 286,644, 11-11-86, Cl. D16-134.000.

Carney, George W.; and Everman, Wilburn D., to Morgan, R. Elliot. Can crushing machine. 286,643, 11-11-86, Cl. D15-123.000.

Carson's, Inc.: *See—*
Culler, Randy R., 286,587, Cl. D6-334.000.
Culler, Randy R., 286,588, Cl. D6-334.000.

Carter International B.V.: *See—*
Perrin, Alain-Dominique, 286,648, Cl. D19-47.000.

Cartier International B.V.: *See*—
Perrin, Alain-Dominique, 286,647, Cl. D19-47.000.
Chu, Ki Kwan. Toy bow. 286,659, 11-11-86, Cl. D21-145.000.
Cook Incorporated: *See*—
Osborne, Thomas A., 286,677, Cl. D24-24.000.
Cooke, Kenneth R.; and Porcelli, Vito L., to AT&T Technologies, Inc. Wall holder for a cordless handset telephone. 286,636, 11-11-86, Cl. D14-61.000.
Craker Jax Studio, Inc.: *See*—
Ficho, William; and Addison, Robert, 286,683, Cl. D27-36.000.
Culler, Randy R., to Carson's, Inc. Chair. 286,587, 11-11-86, Cl. D6-334.000.
Culler, Randy R., to Carson's, Inc. Chair. 286,588, 11-11-86, Cl. D6-334.000.
Curtis, James J.; and Bourgo, Edward A. Knit tubular cover for beverage container. 286,606, 11-11-86, Cl. D7-45.000.
Data General Corporation: *See*—
Gundogan, Can I., 286,641, Cl. D14-113.000.
David, Tom, to Tom David, Inc. Pepper mill. 286,607, 11-11-86, Cl. D7-53.000.
Davis, William A.: *See*—
Ballard, Lannis P.; and Davis, William A., 286,669, Cl. D22-108.000.
Deconinck, Didier, to Allibert SA. Table. 286,592, 11-11-86, Cl. D6-430.000.
Deflecto Corporation: *See*—
Meyer, Stephen T.; and Meyer, C. Rodger, 286,600, Cl. D6-573.000.
de Oliveira, Egidio L., to Sybron Corporation. Thermal indicator for vacuum sterilizer test packs. 286,622, 11-11-86, Cl. D10-57.000.
DePew, Thomas N. All purpose feeder for livestock. 286,692, 11-11-86, Cl. D30-13.000.
Design Institute America, Inc.: *See*—
Berry, Richard D., Jr., 286,598, Cl. D6-511.000.
D'Innocente, Ralph; and Drasin, Larry, to Jacuzzi Inc. Whirlpool bath tub. 286,679, 11-11-86, Cl. D24-38.000.
Diversified Products Corporation: *See*—
Kelley, Robert C., 286,665, Cl. D21-194.000.
Drasin, Larry: *See*—
D'Innocente, Ralph; and Drasin, Larry, 286,679, Cl. D24-38.000.
Dream Sogo Kenkyusho: *See*—
Yosimoto, Kenichirou, 286,593, Cl. D6-440.000.
Dunker, David M.: *See*—
Hickman, Ronald P.; Secoura, Ralph J.; and Dunker, David M., 286,609, Cl. D8-74.000.
Durand, Jean-Jacques. Goblet or similar article. 286,601, 11-11-86, Cl. D7-11.000.
Durand, Jean-Jacques. Goblet or similar article. 286,602, 11-11-86, Cl. D7-11.000.
Durand, Jean-Jacques. Goblet or similar article. 286,603, 11-11-86, Cl. D7-11.000.
Engineering & Research Assoc., Inc.: *See*—
Gummere, John B., 286,594, Cl. D6-455.000.
Everman, Wilburn D.: *See*—
Carney, George W.; and Everman, Wilburn D., 286,643, Cl. D15-123.000.
Exxon Printing Systems, Inc.: *See*—
Parenteau, Paul G., 286,645, Cl. D18-24.000.
Ficho, William; and Addison, Robert, to Craker Jax Studio, Inc. Combined cigarette lighter and sculptured charm. 286,683, 11-11-86, Cl. D27-36.000.
Fields, Tom. Lighted aerial toy. 286,657, 11-11-86, Cl. D21-86.000.
Filsinger, Jonny N. D.; and Long, Patrick E. Combined key holder and self protection device. 286,583, 11-11-86, Cl. D3-62.000.
Fischer, John. Writing instrument sleeve. 286,650, 11-11-86, Cl. D19-55.000.
Fisher, Bryan; and Millar, Richard J. Model skeleton. 286,652, 11-11-86, Cl. D19-62.000.
Fissan Dr. A. Sauer GmbH: *See*—
Becker, Werner, 286,616, Cl. D9-389.000.
Forrest, William E., to Advanced Evacuation Systems. Load-lowering device. 286,688, 11-11-86, Cl. D29-1.000.
Forrest, William E., to Advanced Evacuation Systems. Personal descent control fixture. 286,689, 11-11-86, Cl. D29-1.000.
Fortel, Inc.: *See*—
Martinez, Arthur T., 286,634, Cl. D14-53.000.
Freezinhot Bottle Company Limited: *See*—
Hung, Kung C., 286,681, Cl. D26-49.000.
Friday, Susanne. Cosmetic case. 286,685, 11-11-86, Cl. D28-77.000.
G. & B. Davis Company: *See*—
Ballard, Lannis P.; and Davis, William A., 286,669, Cl. D22-108.000.
Gatarz, Gregory M.; and Banasiak, Joseph G., to American Home Products Corporation (Del). Oven cleaning pad. 286,696, 11-11-86, Cl. D32-45.000.
General Foods Corporation: *See*—
Goodwin, William M.; and Warriner, John M., 286,617, Cl. D9-393.000.
Goodwin, William M.; and Warriner, John M., to General Foods Corporation. Bottle. 286,617, 11-11-86, Cl. D9-393.000.
Greenberg, Isadore M. Eyelid accessory or similar article. 286,686, 11-11-86, Cl. D28-93.000.
Greenlee Landscape Lighting Manufacturing Corporation: *See*—
Greenlee, Melvin D., 286,682, Cl. D26-63.000.
Greenlee, Melvin D., to Greenlee Landscape Lighting Manufacturing Corporation. Lighting fixture or similar article. 286,682, 11-11-86, Cl. D26-63.000.
Griffiths, William H., to Bonsack Baths (London) Limited. Bathtub. 286,671, 11-11-86, Cl. D23-55.000.
Gummere, John B., to Engineering & Research Assoc., Inc. Support stand for a sphere. 286,594, 11-11-86, Cl. D6-455.000.
Gundogan, Can I., to Data General Corporation. Video display terminal. 286,641, 11-11-86, Cl. D14-113.000.
Hamel, Dana, to Ritepoint, a Div. of Penn Corporation. Casing for a writing instrument. 286,649, 11-11-86, Cl. D19-48.000.
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, to Hirsh Company. Support hanger for a shelf. 286,611, 11-11-86, Cl. D8-381.000.
Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 286,631, Cl. D14-11.000.
Hashimoto, Kazuo, to Hashimoto Corporation. Endless cassette tape. 286,631, 11-11-86, Cl. D14-11.000.
Haskell, Henry W. Holder for disassembled engine parts. 286,595, 11-11-86, Cl. D6-467.000.
Haywood, Billy J.; and Haywood, Christa H. Food cup bracket for bird cages. 286,693, 11-11-86, Cl. D30-18.000.
Haywood, Christa H.: *See*—
Haywood, Billy J.; and Haywood, Christa H., 286,693, Cl. D30-18.000.
Hickman, Ronald P.; Secoura, Ralph J.; and Dunker, David M., to Black & Decker Inc. Vise. 286,609, 11-11-86, Cl. D8-74.000.
Hirsh Company: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 286,611, Cl. D8-381.000.
Holmes Products Corp.: *See*—
Kahn, Jordan, 286,673, Cl. D23-122.000.
Honeywell Inc.: *See*—
Pauser, Rodney M., 286,633, Cl. D14-52.000.
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461 4,622,092
610 4,622,093
627 4,622,094
635 4,622,095
643 4,622,096
644 4,622,097
645 4,622,098

CLASS 157

1.1 4,621,671

CLASS 160

115 4,621,672
168 R 4,621,673

CLASS 162

4 4,622,099
65 4,622,100
4,622,101

CLASS 164

103 4,621,674
481 4,621,675
485 4,621,676

CLASS 165

27 4,621,678
39 4,621,679
44 4,621,680
47 4,621,681
76 4,621,682
86 4,621,683
92 4,621,684
111 4,621,685
113 4,621,686
135 4,621,677
152 4,621,687

CLASS 166

75.1 4,621,688
106 4,621,689
241 4,621,690
268 4,621,691
281 4,621,692
311 4,621,693
312 4,621,694
321 4,621,695

CLASS 172

20 4,621,696
42 4,621,697

CLASS 174

52 FP 4,622,433
52 H 4,622,434
57 4,622,435
77 R 4,622,436

CLASS 175

305 4,621,698

CLASS 178

18 4,622,437

CLASS 180

53.7 4,621,699
70.1 4,621,700
79.1 4,621,701
140 4,621,702
143 4,621,703
4,621,704

169 4,621,705
227 4,621,706
247 4,621,707

CLASS 181

144 4,621,708
284 4,621,709

CLASS 184

6.27 4,621,710

CLASS 187

9 E 4,621,711

CLASS 188

4 B 4,621,712
72.7 4,621,713
196 BA 4,621,714
264 R 4,621,715

CLASS 190

108 4,621,716

CLASS 192

0.052 4,621,721
0.055 4,621,722
36 4,621,717
43 4,621,718
48.1 4,621,719
48.92 4,621,720
71 4,621,723

CLASS 196

139 4,621,724

CLASS 198

448 4,621,725
671 4,621,726
810 4,621,727
827 4,621,728

CLASS 200

50 R 4,622,443
303 4,622,444

CLASS 202

185 E 4,622,103
185.3 4,622,102

CLASS 203

18 4,622,104

CLASS 204

1 T 4,622,105
15 4,622,106
4,622,107
4,622,108
38.3 4,622,109
47 4,622,110
67 4,622,111
81 4,622,112
98 4,622,113
129.3 4,622,114
157.41 4,622,115
181.1 4,622,116
181.7 4,622,117
188 4,622,118
190 4,622,119
192.26 4,622,120
298 4,622,121
4,622,122
299 R 4,622,123
301 4,622,124
406 4,622,125
425 4,622,126

CLASS 206

37 4,621,729
77.1 4,621,730
83.5 4,621,731
346 4,621,732
423 4,621,733
427 4,621,734
438 4,621,735
606 4,621,736

CLASS 208

18 4,622,128
58 4,622,127
87 4,622,129
4,622,130

CLASS 209

167 4,622,131
211 4,622,132

CLASS 210

96.2 4,622,133
127 4,622,134
167 4,622,135
168 4,622,136
169 4,622,137
170 4,622,138
4,622,139
177 4,622,140
189 4,622,141
238 4,622,142
321.1 4,622,143
351 4,622,144
404 4,622,145
469 4,622,146
539 4,622,147
615 4,622,148
717 4,622,149
739 4,622,150
4,622,151
769 4,622,152

CLASS 211

70.5 4,621,737
70.6 4,621,738
74 4,621,739
133 4,621,740

CLASS 212

175 4,621,741
177 4,621,742

CLASS 215

308 4,621,743

CLASS 219

10.41 4,622,445
10.55 A 4,622,448
10.55 R 4,622,446
4,622,447
69 R 4,622,449
69 W 4,622,450
76.1 4,622,451
121 ET 4,622,453
121 PR 4,622,452
267 4,622,454
541 4,622,455

CLASS 220

270 4,621,744

CLASS 221

75 4,621,745
76 4,621,746

CLASS 222

137 4,621,747
146.5 4,621,748
153 4,621,749
505 4,621,750

CLASS 223

28 4,621,751

CLASS 224

253 4,621,752
4,621,753

CLASS 225

96 4,621,754
4,621,755

CLASS 226

76 4,621,756

CLASS 227

1 4,621,757
147 4,621,758
152 4,621,759

CLASS 228

112 4,621,760
124 4,621,761
215 4,621,762

CLASS 229

5.5 4,621,763
15 4,621,764
52 AW 4,621,765
52 B 4,621,766

CLASS 235

379 4,622,456
464 4,622,457

CLASS 236

92 R 4,621,767

CLASS 239

44 4,621,768
265.39 4,621,769
304 4,621,770
585 4,621,771
4,621,772

CLASS 241

21 4,621,773
84.2 4,621,774
86.1 4,621,775
101.7 4,621,776

CLASS 242

1 4,621,777
35.5 A 4,621,778
199 4,621,779

CLASS 244

118.2 4,621,780

CLASS 248

118 4,621,781
183 4,621,782
245 4,621,783
430 4,621,784
565 4,621,785

CLASS 249

63 4,621,787

CLASS 250

203 R 4,622,458
4,622,470
214 A 4,622,459
227 4,622,460
231 SE 4,622,461
236 4,622,462
259 4,622,463
343 4,622,464
373 4,622,465
374 4,622,466
389 4,622,467
458.1 4,622,468
4,622,469

CLASS 251

120 4,621,788
129.12 4,621,789
305 4,621,790

CLASS 252

8.514 4,622,153
8.551 4,622,155
8.57 4,622,156
8.8 4,622,154
32.7 E 4,622,157
49.3 4,622,158
62.63 4,622,159
73 4,622,160
90 4,622,161
299.5 4,622,162
299.61 4,622,163
299.63 4,622,164
299.65 4,622,165
313.1 4,622,166
315.7 4,622,167
352 4,622,168
500 4,622,169
518 4,622,170
522 R 4,622,171
4,622,172
528 4,622,173
582 4,622,174
628 4,622,175
631 4,622,176

CLASS 254

17 4,621,791

CLASS 260

389 4,622,180
397.4 4,622,181
544 P 4,622,182

CLASS 261

110 4,622,183

CLASS 264

1.1 4,622,184
4.6 4,622,188
45.2 4,622,185
62 4,622,186
103 4,622,187
112 4,622,189
119 4,622,190
134 4,622,191
136 4,622,192
141 4,622,193
162 4,622,194
168 4,622,195
229 4,622,196
230 4,622,197
318 4,622,198
314 4,622,199

CLASS 266

70 4,621,792
165 4,621,793
256 4,621,794

CLASS 267

8 R 4,621,795
64.28 4,621,796

CLASS 269

34 4,621,797

CLASS 271

5 4,621,798
9 Re.32,281
10 4,621,799
11 4,621,800
251 4,621,801
272 4,621,802
293 4,621,803

CLASS 272

70.3 4,621,804
73 4,621,805
93 4,621,806
117 4,621,807
119 4,621,808
123 4,621,809
134 4,621,810

CLASS 273

1.5 A 4,621,811
29 A 4,621,812
77 A 4,621,813
85 G Re.32,282
138 A 4,621,814
143 R 4,621,815
168 4,621,816
421 4,621,817

CLASS 279

1 B 4,621,820
1 K 4,621,819
1 ME 4,621,818
83 4,621,821

CLASS 280

5 A 4,621,822
91 4,621,823
154.5 R 4,621,824
218 4,621,825
259 4,621,826
281 R 4,621,827
615 4,621,828
628 4,621,829
675 4,621,830
689 4,621,831
707 4,621,832
4,621,833
715 4,621,834
803 4,621,835
807 4,621,836

CLASS 283

105 4,621,837

CLASS 285

41 4,621,838
61 4,621,839
81 4,621,840
158 4,621,841
322 4,621,842
356 4,621,843
381 4,621,844

CLASS 290

42 4,622,471
52 4,622,472
53 4,622,473

CLASS 292

37 4,621,845
152 4,621,846
199 4,621,847
336.3 4,621,848

CLASS 293

155 4,621,849

CLASS 294

81.61 4,621,850
82.2 4,621,851
86.4 4,621,852
88 4,621,853
4,621,854
171 4,621,855

CLASS 296

24 R 4,621,856
35.3 4,621,857
56 4,621,858
78 R 4,621,859
91 4,621,860
118 4,621,861
183 4,621,862

CLASS 297

85 4,621,863
115 4,621,864
157 4,621,865
284 4,621,866
341 4,621,867
347 4,621,868

CLASS 299

81 4,621,869
91 4,621,870
4,621,871

CLASS 301

124 H 4,621,872
124 R 4,621,873

CLASS 303

89 4,621,874

CLASS 307

105 4,622,474
289 4,622,475
310 4,622,476
311 4,622,477
354 4,622,478
482 4,622,479
491 4,622,480
522 4,622,481
585 4,622,482

CLASS 310

328 4,622,483
4,622,484

CLASS 312

250 4,621,876
257 R 4,621,877
4,621,878
258 4,621,879

CLASS 313

25 4,622,485
115 4,622,486
273 4,622,487
318 4,622,488
365 4,622,489
402 4,622,490
414 4,622,491
422 4,622,492
642 4,622,493

CLASS 315

77 4,622,494
248 4,622,495
283 4,622,496
366 4,622,497
382 4,622,498

CLASS 318

254 4,622,499
341 4,622,500
561 4,622,504
627 4,622,501
640 4,622,502
645 4,622,503
696 4,622,505
786 4,622,506

CLASS 320

1 4,622,510
2 4,622,507
13 4,622,508
36 4,622,509

CLASS 323

282 4,622,511
313 4,622,512
343 4,622,513

CLASS 324

158 D 4,622,515
158 P 4,622,514
163 4,622,516
262 4,622,517
341 4,622,518

CLASS 328

137 4,622,519

CLASS 329

112 4,622,520

CLASS 330

9 4,622,521

CLASS 333

24 R 4,622,522
28 R 4,622,523
126 4,622,524
151 4,622,525
181 4,622,526
182 4,622,527
205 4,622,528

CLASS 335

21 4,622,529
167 4,622,530
216 4,622,531
292 4,622,532

CLASS 337

114 4,622,533
404 4,622,534

CLASS 339

17 LC 4,621,880
26 4,621,881
30 4,621,882
60 M 4,621,883
75 MP 4,621,884
91 R 4,621,885
107 4,621,886
276 T 4,621,887

CLASS 340

310 R 4,622,535
347 DA 4,622,536
347 DD 4,622,537
506 4,622,538
4,622,539
531 4,622,540
566 4,622,541
572 4,622,542
4,622,543
636 4,622,544
747 4,622,545
748 4,622,546
750 4,622,547
753 4,622,548
805 4,622,549
825.05 4,622,550
825.06 4,622,551

CLASS 342

67 4,622,554
84 4,622,555
91 4,622,553
174 4,622,556
196 4,622,552
357 4,622,557

CLASS 343

742 4,622,558
786 4,622,559

CLASS 346

1.1 4,622,560
4,622,561
75 4,622,562
76 PH 4,622,563
160 4,622,564
201 4,622,565
214 4,622,566

CLASS 350

1.2 4,621,888
1.6 4,621,889
6.1 4,621,890
6.2 4,621,891
6.3 4,621,892
6.5 4,621,893
96.19 4,621,894
96.21 4,621,895
96.29 4,621,896
130 4,621,897
276 R 4,621,898
321 4,621,899
350 R 4,621,900
4,621,901
390 4,621,903
410 4,621,904
427 4,621,905
429 4,621,906
432 4,621,907
4,621,908
464 4,621,909
469 4,621,910
524 4,621,911
576 4,621,902

CLASS 351

160 R 4,621,912

CLASS 353

39 4,621,913

CLASS 354

21 4,621,914
74 4,621,786
121 4,621,915
234.1 4,621,916
403 4,621,917
448 4,621,918

CLASS 355

3 DR 4,621,919
3 R 4,621,920
3 SH Re.32,284
14 SH 4,621,921
41 4,621,922
133 4,621,923

CLASS 356

153 4,621,924
350 4,621,925
363 4,621,926

CLASS 357

23.1 4,622,567
23.4 4,622,568
4,622,569
23.6 4,622,570
38 4,622,572
42 4,622,571
4,622,573
4,622,574
59 4,622,575
71 4,622,576

CLASS 358

11 4,622,577
12 4,622,578
13 4,622,579
50 4,622,580
51 4,622,581
80 4,622,582
84 4,622,583
98 4,622,584
135 4,622,585
153 4,622,586
167 4,622,587
183 4,622,588
4,622,589
241 4,622,590

256 4,622,591
257 4,622,592
284 4,622,593
293 4,622,594
296 4,622,595
335 4,622,596
343 4,622,597

CLASS 360

22 4,622,598
31 4,622,599
32 4,622,600
48 4,622,601
4,622,602
78 4,622,603
4,622,604
92 4,622,610
94 4,622,605
96.5 4,622,606
97 4,622,607
106 Re.32,285
4,622,608
4,622,609
113 4,622,613
118 4,622,614
121 4,622,615
122 4,622,616
128 4,622,617
133 4,622,618

CLASS 361

306 4,622,619
323 4,622,620
382 4,622,621
433 4,622,611
4,622,612

CLASS 362

30 J 4,622,626
65 4,622,622
84 4,622,623
217 4,622,624
304 4,622,625

CLASS 363

37 4,622,627
4,622,628
70 4,622,629

CLASS 364

134 4,622,630
200 4,622,631
4,622,632
4,622,633
414 4,622,634
422 4,622,635
424 4,622,636
424.1 4,622,637
431.04 Re.32,286
431.08 4,622,638
463 4,622,639
483 4,622,640
518 4,622,641
555 4,622,642
556 4,622,643
559 4,622,644
560 4,622,645
571 4,622,646
580 4,622,647
715 4,622,648
728 4,622,649
748 4,622,650
900 4,622,651
4,622,652

CLASS 365

49 4,622,653
108 4,622,654
149 4,622,655
185 4,622,656

CLASS 366

132 4,621,927
137 4,621,928

CLASS 367

129 4,622,657

CLASS 369

31 4,622,658
45 4,622,659
134 4,622,660
280 4,622,661

CLASS 370

3 4,622,662
4,622,663
86 4,622,664
100 4,622,665
4,622,666

CLASS 371

9 4,622,667
20 4,622,668
25 4,622,669
43 4,622,670

CLASS 372

19 4,622,671
32 4,622,672
45 4,622,673
4,622,674
58 4,622,675
70 4,622,676

CLASS 373

101 4,622,677
134 4,622,678
152 4,622,679

CLASS 374

43 4,621,929

CLASS 375

25 4,622,680
48 4,622,681
58 4,622,682
90 4,622,683
116 4,622,684
121 4,622,685

CLASS 376

159 4,622,200
192 4,622,201
246 4,622,202
272 4,622,203
442 4,622,204

CLASS 377

55 4,622,686

CLASS 378

130 4,622,687
143 4,622,688

CLASS 379

63 4,622,438
252 4,622,439
345 4,622,441
402 4,622,442

CLASS 381

24 4,622,689
31 4,622,690
68.1 4,622,440
86 4,622,691
94 4,622,692

CLASS 383

119 4,622,693

CLASS 384

45 4,621,875
105 4,621,930
114 4,621,931
569 4,621,932

CLASS 400

555 4,621,933

CLASS 401

19 4,621,934
82 4,621,935
215 4,621,936

CLASS 403

197 4,621,937
217 4,621,938

CLASS 404

4 4,621,939
10 4,621,940
26 4,621,941
41 4,621,942
70 4,621,943
75 4,621,944

CLASS 405

39 4,621,945
61 4,621,946
146 4,621,947
4,621,948
202 4,621,949
231 4,621,950
303 4,621,951

CLASS 406

138 4,621,952
193 4,621,953

CLASS 407

22 4,621,954
114 4,621,955

CLASS 408

1 R 4,621,956
93 4,621,957
232 4,621,958

CLASS 409

84 4,621,959
232 4,621,960

CLASS 411

352 4,621,961
368 4,621,962
369 4,621,963

CLASS 413

9 4,621,964

CLASS 414

7 4,621,965
43 4,621,966
225 4,621,967
311 4,621,968
331 4,621,969
412 4,621,970
431 4,621,971
477 4,621,972
686 4,621,973
786 4,621,974

CLASS 415

111 4,621,975
191 4,621,976

CLASS 416

5 4,621,977
127 4,621,978
219 R 4,621,979
226 4,621,980

CLASS 417

83 4,621,981
201 4,621,982
222 4,621,983
234 4,621,984
250 4,621,985
306 4,621,986
313 4,621,987
342 4,621,988
383 4,621,989
395 4,621,990
423 A 4,621,991
572 4,621,992

CLASS 418

55 4,621,993
206 4,621,994

CLASS 420

61 4,622,067
111 4,622,081
566 4,622,205

CLASS 422

48 4,622,206
56 4,622,207
65 4,622,208
112 4,622,209
144 4,622,210
248 4,622,211

CLASS 423

226 4,622,212
242 4,622,213
277 4,622,214
440 4,622,215
515 4,622,216

CLASS 424

1.1 4,622,217
9 4,622,218
38 4,622,219
49 4,622,220
76 4,622,221
89 Re.32,283
4,622,222
92 4,622,223

CLASS 425

144 4,621,995
190 4,621,996
299 4,621,997
329 4,621,998
371 4,621,999
467 4,622,000
549 4,622,001
577 4,622,002

CLASS 426

16 4,622,224
27 4,622,225
94 4,622,226
96 4,622,227
241 4,622,228
395 4,622,229
433 4,622,230
438 4,622,231
548 4,622,232
4,622,233
643 4,622,234

CLASS 427

25 4,622,235
38 4,622,236
40 4,622,237
45.1 4,622,238
96 4,622,239
4,622,240
117 4,622,241
163 4,622,242
176 4,622,243
213.32 4,622,244
230 4,622,245
327 4,622,246
356 4,622,247
440 4,622,248

CLASS 428

34 4,622,249
35 4,622,250
36 4,622,251
88 4,622,252
91 4,622,253
102 4,622,254
116 4,622,255
131 4,622,256
143 4,622,257
171 4,622,258
4,622,259
173 4,622,260
195 4,622,261
219 4,622,262
288 4,622,263
332 4,622,264
364 4,622,265
394 4,622,266
402.21 4,622,267
480 4,622,268
550 4,622,269
608 4,622,270
615 4,622,271
668 4,622,273
690 4,622,272

CLASS 429

1 4,622,274
19 4,622,275
46 4,622,276
94 4,622,277

CLASS 430

59 4,622,278
66 4,622,279
70 4,622,280
107 4,622,281
138 4,622,282
191 4,622,283
290 4,622,284
322 4,622,285
343 4,622,286
505 4,622,287
527 4,622,288
559 4,622,289
574 4,622,290

CLASS 431

1 4,622,003
76 4,622,004
78 4,622,005

CLASS 432

11 4,622,006
13 4,622,007
95 4,622,008
156 4,622,009

CLASS 433

173 4,622,010
221 4,622,011
4,622,012

CLASS 434

118 4,622,013
278 4,622,014

CLASS 435

4 4,622,291
5 4,622,292
7 4,622,293
4,622,294
22 4,622,295
26 4,622,296
32 4,622,297
34 4,622,298
96 4,622,299
105 4,622,300
146 4,622,301
172.2 4,622,302
243 4,622,303
253 4,622,304

CLASS 436

103 4,622,305
150 4,622,306

CLASS 440

55 4,622,015
70 4,622,016
101 4,622,017

CLASS 441

123 4,622,018

CLASS 446

153 4,622,019
298 4,622,020
320 4,622,021

CLASS 455

47 4,622,694
58 4,622,695

CLASS 464

162 4,622,022

CLASS 474

93 4,622,023
102 4,622,024
245 4,622,025

CLASS 493

104 4,622,026
226 4,622,027
413 4,622,028

CLASS 494

2 4,622,029

CLASS 501

38 4,622,307

CLASS 502

66 4,622,308
115 4,622,309
208 4,622,310
235 4,622,311

CLASS 514

12 4,622,312
30 4,622,313
54 4,622,314
70 4,622,315
162 4,622,316
178 4,622,317
200 4,622,318
220 4,622,319
4,622,320
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CLASS 521

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CLASS 523

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212 4,622,351
401 4,622,353
527 4,622,354

CLASS 524

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100 4,622,356
270 4,622,357
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54.1 4,622,362
67 4,622,363
200 4,622,364
332.5 4,622,365
380 4,622,366
381 4,622,367
426 4,622,368
440 4,622,369

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190 4,622,372
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286 4,622,376
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443 4,622,420
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595 4,622,425

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20 4,622,031
122 4,622,032
172 4,622,033
179 4,622,034
293 4,622,035
367 4,622,036

CLASSIFICATION OF DESIGNS

D2—	636	286,581		573	286,600		435	286,620			286,640		147	286,660	D26—	4	286,680
	642	286,580	D7—	11	286,601	D10—	32	286,621		113	286,641			286,661		49	286,681
D3—	58	286,582			286,602		57	286,622	D15—	10	286,642		161	286,662		63	286,682
	62	286,583			286,603	D11—	6	286,623		123	286,643		163	286,663	D27—	36	286,683
D6—	318	286,584		15	286,604			286,624	D16—	134	286,644		194	286,665	D28—	64	286,684
	319	286,585		17	286,605	D12—	128	286,626	D18—	24	286,645		195	286,664		77	286,685
	334	286,586		45	286,606		130	286,625	D19—	36	286,646		210	286,666		93	286,686
		286,587		53	286,607		187	286,627		47	286,647		234	286,667			286,687
		286,588		106	286,608			286,628			286,648		239	286,668	D29—	1	286,688
	373	286,589	D8—	74	286,609		307	286,629		48	286,649	D22—	108	286,669			286,689
	390	286,590		359	286,610	D14—	11	286,630		55	286,650	D23—	7	286,670	D30—	2	286,690
	417	286,591		381	286,611			286,631		62	286,651		55	286,671		6	286,691
	430	286,592		391	286,612		36	286,632			286,652		121	286,672		13	286,692
	440	286,593	D9—	318	286,613		52	286,633	D21—	4	286,653		122	286,673		18	286,693
	455	286,594		352	286,614		53	286,634		37	286,654		148	286,674		99	286,694
	467	286,595		370	286,615		57	286,635		49	286,655			286,675	D32—	21	286,695
	476	286,596		389	286,616		61	286,636		59	286,656	D24—	17	286,676		45	286,696
	491	286,597		393	286,617		100	286,637		86	286,657		24	286,677		74	286,697
	511	286,598		416	286,618		111	286,638		109	286,658		38	286,678	D34—	23	286,698
	525	286,599		432	286,619			286,639		145	286,659			286,679		26	286,699

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	4,621,826		4,621,955		4,621,610		4,621,728		4,621,744		4,622,527
	4,622,283		4,621,961		4,621,644		4,621,774		4,621,746		4,622,589
02 :	4,622,473		4,621,987		4,621,840		4,621,817		4,621,754	19 :	4,621,398
04 :	4,621,413		4,622,013		4,621,974		4,621,846		4,621,758		4,621,615
	4,621,519		4,622,135		4,622,251		4,621,860		4,621,781		4,621,715
	4,621,589		4,622,146		4,622,304		4,621,907		4,621,782		4,621,741
	4,621,629		4,622,157		4,622,307		4,621,908		4,621,788		4,621,742
	4,621,767		4,622,174		4,622,499		4,621,976		4,621,837		4,621,807
	4,621,804		4,622,223		4,622,599		4,622,139		4,621,842		4,621,945
	4,621,813		4,622,224	09 :	4,621,391		4,622,218		4,621,858		4,621,968
	4,622,028		4,622,225		4,621,395		4,622,219		4,621,861		4,621,973
	4,622,434		4,622,257		4,621,425		4,622,317		4,621,876		4,622,299
	4,622,551		4,622,274		4,621,520		4,622,525		4,621,915	20 :	4,621,574
	4,622,555		4,622,294		4,621,638		4,622,542		4,621,963		4,621,723
	4,622,633		4,622,305		4,621,648		4,622,569		4,621,964		4,621,766
	4,622,667		4,622,315		4,621,718		4,622,685		4,622,019		4,621,776
	4,622,669		4,622,362		4,621,719	13 :	4,621,769		4,622,075		4,621,798
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	4,621,378		4,622,457		4,621,979		4,622,042		4,622,244		4,622,152
	4,621,414		4,622,459		4,621,980		4,622,043		4,622,250		4,622,255
	4,621,415		4,622,462		4,622,020		4,622,044		4,622,338		4,622,487
	4,621,444		4,622,467		4,622,050		4,622,092		4,622,359		4,622,496
	4,621,452		4,622,468		4,622,059		4,622,675		4,622,380	22 :	4,621,563
	4,621,458		4,622,476		4,622,124	15 :	4,621,646		4,622,386		4,622,454
	4,621,465		4,622,483		4,622,231		4,622,033		4,622,387	24 :	4,621,409
	4,621,488		4,622,503		4,622,233		4,622,136		4,622,388		4,621,893
	4,621,535		4,622,507		4,622,348	16 :	4,621,429		4,622,405		4,621,896
	4,621,567		4,622,511		4,622,356		4,621,737		4,622,413		4,621,926
	4,621,572		4,622,514		4,622,406		4,621,828		4,622,498		4,622,230
	4,621,613		4,622,521		4,622,530		4,622,648		4,622,500		4,622,291
	4,621,621		4,622,536		4,622,538	17 :	4,621,390		4,622,526		4,622,302
	4,621,625		4,622,545		4,622,574		4,621,392		4,622,539		4,622,552
	4,621,632		4,622,546		4,622,624		4,621,399		4,622,578		4,622,556
	4,621,636		4,622,575		4,622,651		4,621,442		4,622,629		4,622,557
	4,621,637		4,622,576		4,622,686		4,621,470		4,622,693	25 :	4,621,424
	4,621,643		4,622,593	10 :	4,621,544		4,621,471	18 :	4,621,380		4,621,708
	4,621,658		4,622,607		4,622,062		4,621,473		4,621,438		4,621,877
	4,621,670		4,622,631		4,622,143		4,621,477		4,621,504		4,621,916
	4,621,688		4,622,635		4,622,167		4,621,486		4,621,540		4,622,109
	4,621,709		4,622,659		4,622,372		4,621,503		4,621,605		4,622,123
	4,621,738		4,622,660		4,622,384		4,621,510		4,621,760		4,622,394
	4,621,743		4,622,676		4,622,423		4,621,516		4,621,868		4,622,437
	4,621,790		4,622,681	11 :	4,621,739		4,621,553		4,622,207		4,622,512
	4,621,825		4,622,683		4,622,471		4,621,571		4,622,241		4,622,515
	4,621,882		4,622,687	12 :	4,621,381		4,621,592		4,622,293		4,622,516
	4,621,924		4,622,690		4,621,388		4,621,626		4,622,379		4,622,540
	4,621,929		4,622,695		4,621,448		4,621,633		4,622,398		4,622,544
	4,621,930	08 :	4,621,511		4,621,616		4,621,634		4,622,422		4,622,609
	4,621,942		4,621,522		4,621,624		4,621,714		4,622,481		4,622,627

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37 : 286,587
286,588
286,598
39 : 286,586
286,670
286,686
40 : 286,667

286,691
41 : 286,582
286,605
42 : 286,612
47 : 286,583
286,597
48 : 286,613
286,682
286,685
286,690
49 : 286,604
50 : 286,595

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37 : 5,799

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